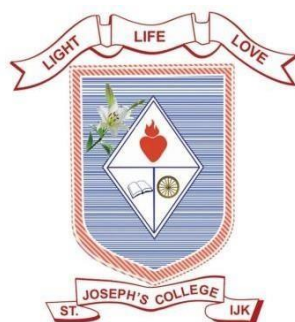




ST. JOSEPH'S COLLEGE (AUTONOMOUS)

IRINJALAKUDA



CURRICULA AND SYLLABI FOR

BACHELOR OF COMPUTER APPLICATIONS

Under Choice Based Credit & Semester System

2020 Admissions

St. Joseph's College (Autonomous), Irinjalakuda

Department of Computer Science

Board of Studies in Computer Science

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FOREWORD

Higher Education scenario in Kerala has been going through turbulent transformations in recent times with the grant of autonomy to colleges by the State Government. There is no doubt about the qualitative worth of the institutions handpicked for autonomy. However, there are apprehensions about the absorption and implementation of the package of autonomy. St. Joseph's College was given autonomy in the year 2016, and has since then been endeavouring to reinvent itself.

Academic autonomy has given us the freedom to recreate our own curriculum and syllabus keeping in mind the challenges and changing needs of the society, the nation, the industry and the world. Hence, a structured feedback on the requirements of the new millennium was sought from all the relevant stakeholders of the institution- students, faculty, alumnae, parents, industry experts, employers etc.

The suggestions of the stakeholders were incorporated into the curricula and syllabi, and presented in the respective Boards of Studies for discussion. The changes pointed out were duly considered and the restructured syllabi are then presented to, and ratified by, the Academic Council.

The role of the IQAC of the college in the above exercise is laudatory. The Cell spearheads all the quality enhancement endeavours, including that of curriculum and syllabus redesigning. By organizing workshops, seminars and hands on training sessions, the cell has facilitated a smooth conduct of the restructuring process. At the end of the year, an evaluation of the syllabi followed is also undertaken, with suggestions noted down for future changes.

As an institution that wishes seriously to provide enhanced quality education to young women students in order to empower them to be fit for the changing world, St. Joseph's College is bravely facing the challenges even as it is happily handling the possibilities, that autonomy has brought to it. Academic enriching programmes, skill – based micro credentials, ICT up gradations, promotional activities for a culture of research, etc are a few of the multifarious responsibilities invested with the college in its restructuring of curriculum and redesigning of syllabus.

I specially thank the IQAC, the Heads of various departments the faculty, and staff, directly in charge of the syllabus updation, for their sincere and dedicated efforts.

Principal

ACKNOWLEDGEMENT

The syllabus restructuring of the Bachelor in computer Applications programme would not have been possible without the guidance and the help of several individuals who in one way or other contributed and extended their valuable assistance in the preparation and completion of this work. The Board of Studies in Department of Computer Science takes this opportunity to express our deep appreciation to all academicians and professionals who participate in the workshops organized by St. Joseph's College (Autonomous) for restructuring the UG Course in Department of Computer Science. I remember with gratitude the support of our Principal, Dr. Sr. Lissy Anto P, Dr. Saritha Namboothiri, Senate member in the University of Calicut, Associate Professor and Head, Department of computer science, Sreekrishnapuram V.T. Bahatathirippad College. I am grateful to the Board of Studies members of the Department of Computer Science for their valuable insights and guidance throughout the process. I am indebted to the faculties of Department of Computer Science for their kind co-operation in all phases of this syllabus restructuring process. We place on record our gratitude to the IQAC Co-ordinator Dr. Naijil George, Assistant Professor of Department of Biotechnology, for the timely and valuable guidance. We express our whole-hearted gratitude to all those who have helped us in this endeavor.

Sr. Siji P D, Chairman,
Board of Studies
Department of Computer Science

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ST. JOSEPH'S COLLEGE, (AUTONOMOUS), IRINJALAKUDA

DEPARTMENT OF COMPUTER SCIENCE

2020 ADMISSION

Preface

Bachelor in Computer Applications Programme at Department of Computer Science, St. Joseph's College (Autonomous), Irinjalakuda was following the syllabus of University of Calicut, from the academic year 2012-2013. After it was granted academic autonomy in the year 2015, and hence has the privilege of restructuring the syllabus. Keeping an eye on the industry and to modernize the curriculum, the Board of Studies members of the Department of Computer Science, St. Joseph's College, (Autonomous), Irinjalakuda has initiated restructuring of the syllabus for Bachelor in Computer Applications programme for 2020 Admissions. The syllabus aims to focus on enabling the students to familiarize with the new technologies, and at the same time enhance and strengthen the fundamental knowledge in Computer Applications, Mathematics, and Statistics.



STUDENT ATTRIBUTES

The motto of the institution is “Light, Life, Love”

Light for the illumination of the heart and mind

Life for the fullness of growth – physical, mental, intellectual and spiritual

Love for fellowship with the Supreme & with one another

The motto enshrines the vision of the Founders for the students and constitutes the foundation for the acquisition of the following student attributes envisioned by the institution.

- Empowerment
- Life Long Learning
- Holistic Development
- Value Orientation
- Social Responsibility
- Nation Building Capacity
- Green Thinking
- Creativity & Innovation
- Acquiring Life Skills
 - Discipline
 - Leadership / Team skills
 - Problem solving skills
 - Communicability

The above Student Attributes will be attained in the span of their student life at St. Joseph’s College through various activities such as

- Curricular, Co-curricular & extra-curricular
- Sports, games, fine arts and cultural
- Enrichment / certificate courses
- Extension / outreach programmes
- Healthy / Best practices

PROGRAMME OUTCOMES

At the end of a UG programme, a student would have:

1. Acquired adequate subject knowledge
2. Attained a foundation for higher and lifelong learning
3. Comprehended the basics of research and analytical skills
4. Obtained sound moral and ethical values
5. Become conscious of environmental and societal responsibilities
6. Attained communication skills and entrepreneurial competency
7. Ability to acknowledge diverse ideas and different points of view
8. Become empowered to face the challenges of the changing world

PROGRAMME SPECIFIC OUTCOME

	Program Specific Outcomes
PSO1	Create a foundation graduate which will act as a feeder course for higher studies in the area of Computer Science/Applications
PSO2	Understand the concepts of computer architecture, networks, graphics and e- commerce
PSO3	Understand the basics of computer programming and numerical analysis.
PSO4	Apply and verify theoretical concepts through laboratory experiments.

AIMS AND OBJECTIVES

First Semester

- To equip the students with fundamentals of Computer
- To learn the basics of Computer organization
- To equip the students to write algorithm and draw flow chart for solving simple problems
- To learn the basics of Internet and webpage design
- To learn the basic principles of linear algebra and vectors.
- To learn the basic principles of differential and integral Calculus.
- To learn mathematical modeling using ordinary and partial equations.

Second Semester

- To equip the students with fundamental principles of Problem Solving aspects.
- To learn the concept of programming
- To study C language
- To equip the students to write programs for solving simple computing problems
- To make the students learn web designing
- To make the students learn programming environments.
- To practice procedural programming concepts.
- To make the students equipped to solve mathematical or scientific problems using C
- To get a general understanding of the important tools for managerial decision making.
- To get a general understanding of different mathematical models

Third Semester

- To learn basics of Python programming
- To learn decision making, looping and functions in Python
- Understand Object Oriented Programming using Python
- To introduce the concept of data structures
- To make the students aware of various data structures
- To equip the students implement fundamental data structures
- To learn numerical differentiation and integration.
- To get a general introduction to the theory of Computer Science

Fourth Semester

- To understand internals of Microprocessor.

- To learn the basic principles of database and database design
- To make the students equipped to solve mathematical or scientific problems using C
- To get a general introduction of the Electronic Commerce framework.
- To get a general understanding on the various electronic payment system.
- To learn the basics of Computer Graphics.

Fifth Semester

- To learn logic gates, combinational circuits and sequential circuits
- To review on concept of OOP.
- To learn Java Programming Environments.
- To learn engineering practices in Software development.
- To learn various software development methodologies and practices.
- To learn basics of computer organization and architecture
- To learn Office Automation.

Sixth Semester

- To have a review on concept of Android programming.
- To learn Android Programming Environments.
- To learn objectives & functions of Operating Systems.
- To understand processes and its life cycle.
- To learn about transmissions in Computer Networks.
- To learn various Protocols used in Communication.
- To provide practical knowledge on software development process
- To build fundamental knowledge in system software.

COURSE DESIGN

The BCA programme includes

- i. Common Courses
- ii. Core courses
- iii. Complementary courses
- iv. Open Course
- v. Audit courses

The number of Courses for the BCA programme contains 14 compulsory core courses and 1 elective course from the frontier area of the core courses, one open course and a project; 8 complementary courses, from the relevant subjects for complementing the core of study. There are 6 common courses which includes the English and second language of study. Project Work and/or Viva-voce are mandatory for BCA programme and these shall be done in the end of sixth semester. The student shall select any Choice based course offered by the department which offers the core courses, depending on the availability of teachers and infrastructure facilities, in the institution. Open course shall be offered in any course and the student shall have the option to do courses offered by other departments.

Duration of the Programme

The minimum duration for completion of a six semester UG Programme is 3 years. The duration of each semester will be 90 working days, inclusive of examinations, spread over five months. The odd semesters (1, 3, 5) shall be from June to October and the even semesters (2, 4, 6) shall be from November to March subject to the academic calendar of St. Joseph's College (Autonomous) Irinjalakuda.

Programme structure

A student is required to acquire a minimum of 140 credits for the completion of the UG programme, of which 120 credits are to be acquired from class room study and shall only be counted for SGPA and CGPA. Out of the 120 credits, 38 (22 for common (English) courses + 16 for common languages other than English) credits shall be from common courses, 2 credits for project/corresponding paper and 3 credits for the open course. (In the case of LRP Programmes 14 credits for common courses (English), 8 credits for additional language courses and 16 credits for General courses). The maximum credits for a course shall not exceed 5. Audit courses shall have 4 credits per course and a total of 16 credits in the

mentioned in the Grade card. The credits of audited courses or extra credits are not counted for SGPA or entire programme. The maximum credit acquired under extra credit shall be 4. If more Extra credit activities are done by a student, that may be CGPA.

Course	Credit		Number	Total credits
	3	4		
Common Courses	2	4	6	22
General Course		4	4	16
Core courses	11	4	15	49
Elective Courses	1		1	3
Complementary courses	8		8	24
Open Course	3		1	3
Audit courses		4	4	16
Project / Industry visit	1		1	3
Community responsibility/NSS/NCC		1	1	4
Total			41	140

Common Courses

UG student should undergo 10 common courses (total 38 credits)for completing theprogramme:

A01. Common English Course 1 A02. Common English Course II A03. Common English Course III A04. Common English Course IV A05. Common English Course V A06. Common English Course VI	English courses A01-A06 applicable to BA/BSC Regular pattern English courses A01-A04 applicable to Language Reduced Pattern (LRP) Programmes B.com, BBA, BBA (T), BBM, B.Sc. (LRP), BCA etc.
A07. Additional Language Course I A08. Additional Language Course II A09. Additional Language Course III A10. Additional Language Course IV	Addl. Language courses A07-A10 applicable to BA/B.Sc Regular Pattern Addl. Language courses A07-A08 applicable to Language Reduced Pattern (LRP) Programmes

SJBCA3A11. General Course I SJBCA3A12. General Course II SJBCA4A13. General Course III SJBCA4A14. General Course IV	Applicable to Language Reduced Pattern (LRP) Programmes
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Common courses A01-A06 shall be taught by the department of English and A07-A10 by teachers of additional languages respectively. General courses A11-A14 shall be offered by teachers of departments offering core courses concerned.

(modify accordingly for LRP courses)

General courses I, II, III and IV shall be designed by the group of boards concerned.

The subjects under Language Reduced Pattern (LRP) (Alternative Pattern) are grouped into five and General Courses I, II, III & IV shall be the same for each group.

1. BBA, B.Com.
2. Industrial Chemistry, Polymer Chemistry
3. Computer Science, Computer Application.
4. Biotechnology
5. B.A. Multimedia

Common Courses in various programmes

No.	Programme	Semester I	Semester II	Semester III	Semester IV
1	B.A. & B.Sc.	A01, A02, A07	A03, A04, A08	A05, A09	A06, A10
2	LRP	A01, A02, A07*	A03, A04, A08*	A11, A12	A13, A14

Core courses

Core courses are the courses in the major (core) course of the BCA programme chosen by the student.

Semester	Course	Teaching Hours	Credit
I	Core Courses (Theory/Practical)	4	3

II	Core Courses (Theory/Practical)	4	7
III	Core Courses (Theory/Practical)	7	3
IV	Core Courses (Theory/Practical)	7	7
V	Core Courses (Theory/Practical)	22	12
VI	Core Courses (Theory /Practical) Including: <ul style="list-style-type: none"> • Viva-voce (Optional) • Project Work / Dissertation • Study Tour / Field visit / Industrial visit / Trip for specimen collection Elective Courses (Theory/Practical)	25	23
Total credit			55

Elective courses shall be spread over either in the Fifth & sixth Semesters combined or in any one of these Semesters (V / VI). Study Tour / Field visit / Industrial visit / Trip for specimen collection may be conducted as a part of the Programme.

Complementary courses

Complementary courses cover one or two disciplines that are related to the core subject and are distributed in the first four semesters.

Semester	Course	Teaching Hours	Credit
I	Complementary Courses (Theory/Practical)	8	6
II	Complementary Courses (Theory/Practical)	8	6
III	Complementary Courses	10	6

	(Theory/Practical)		
IV	Complementary Courses (Theory/Practical)	10	6
Total credit			24

Open courses

There shall be one open course in core subjects in the fifth semester. The open course shall be open to all the students in the institution except the students in the parent department. The students can opt that course from any other department in the institution. Each department can decide the open course from a pool of three courses creditallotted for open course is 3 and the hours allotted is 3.

(IQAC will update the full list of Open courses available in the college)

Ability Enhancement courses/Audit courses

These are courses which are mandatory for a programme but not counted for the calculation of SGPA or CGPA. There will be one Audit course each in the first four semesters. These courses are not meant for class room study. The students can attain only pass (Grade P) for these courses. At the end of each semester there will be examination conducted by the college from a pool of questions (Question Bank) set by the College. The students can also attain these credits through online courses like SWAYAM, MOOC etc. (optional). The list of courses in each semester with credits are given below.

Course with credit	Credit	Semester
Environment Studies	4	1
Disaster Management	4	2
Human Rights/Intellectual Property Rights/ Consumer Protection	4	3
Gender Studies/Gerontology-	4	4

Extra credit Activities

Extra credits are mandatory for the programme. Extra credits willbe awarded to students who participate in activities like NCC, NSS and Swatch Bharath. Those students who could not join in any of the above activities have to undergo Social Service Programme offered by the College. Extra credits are not counted for SGPA or CGPA.

Attendance

A student shall be permitted to appear for the semester examination, only if she secures not less than 75% attendance in each semester. Attendance will be maintained by the Department concerned. Condonation of shortage of attendance to a maximum of 10% in the case of single condonation and 20% in the case of double condonation in a semester shall be granted by College remitting the required fee. Benefits of attendance may be granted to students who attend the approved activities of the college with the prior concurrence of the Head of the institution. Participation in such activities may be treated as presence in lieu of their absence on production of participation/attendance certificate (within two weeks) in curricular/extracurricular activities (maximum 9 days in a semester). Students can avail of condonation of shortage of attendance in a maximum of four semesters during the entire programme (Either four single condonations or one double condonation and two single condonations during the entire programme). Less than 50% attendance requires Readmission. Readmission is permitted only once during the entire programme.

Grace Marks

Grace Marks may be awarded to a student for meritorious achievements in co-curricular activities (in Sports/Arts/NSS/NCC/Student Entrepreneurship) carried out besides the regular hours. Such a benefit is applicable and limited to a maximum of 8 courses in an academic year spreading over two semesters. In addition, maximum of 6 marks per semester can be awarded to the students of UG Programmes, for participating in the College Fitness Education Programme (COFE).

Project

Every student of a BCA programme shall have to work on a project of 2 credits under the supervision of a faculty member or shall write a theory course based on Research Methodology as per the curriculum.

(Write more details about the project, number of students in one project)

COURSE CODE FORMAT

The following are the common guidelines for coding various courses in order to get a uniform identification. It is advisable to assign a nine digit code (combination of Alpha Numerical) for various courses as detailed below:

- i. Common Courses (Code A)
- ii. Core courses (Code B)

- iii. Complementary courses (Code C)
- iv. Open Course (Code D)
- v. Audit courses (Code E).

1. **First two digits** indicate the code of college SJ
2. **Next three digits** indicate the Programme/discipline code (ENGforEnglish,MCMfor M.Com, CHE for chemistry, PHY for physics, MLM for Malayalam, SKT for Sanskrit, HTYfor History etc.)
3. **Sixth digit** is the Semester indicator which can be given as 1, 2, 3 & 4 respectively for I, II, III & IV Semester (MCM1, CHE2 Etc).
4. **Seventh digit** will be the Course Category indicator as detailed below:

Sl No	Nature of Course	Course Code
1	Core Courses	C
2	Elective Courses	E
3	Project	P
4	Comprehensive Viva	V
5	Practical / Lab	L
6	Audit Courses	A

5. **Last two digits** indicate the serial number of the respective courses. If there is one digit it should be prefixed by '0'(Zero). (01, 02,etc)
6. If the number of courses in one category is only one (eg : Viva, Project etc.), assign the course serial number as01.
7. Examples:

Sl. No	Code	Details
1	SJMCM 1C01	M.Com I Sem Core Course No1
2	SJCHE 2 A 02	Chemistry II Sem Audit Course No.2
3	SJENG 4 V01	English IV Sem Viva No. 1
4	SJMLM 3 E02	Malayalam III Sem Elective No. 2
5	SJPHY 4 P 01	Physics IV Sem Project Work No. 1
6	SJ BGY 2 L 02	Biology II Sem Practical No. 2

7	SJPSY 3 C 02	Psychology III Sem Core Coure No. 2
8	SJHTR 2 E 01	History II Sem Elective Course No. 1

Scheme- Core Course

The following table shows the structure of the programme which indicates course code, course title, instructional hours and credits.

Semester I						
Course Code	Title of the course	Number of hours per week	Total Credits	Total hours/semester	Marks	
					CA	ESE
SJBCA1B01	Computer Fundamentals & HTML	4	3	52	15	60
Semester II						
SJBCA2B02	Problem Solving using C	4	3	52	15	60
SJBCA2B03	Programming Laboratory I: HTML and Programming in C	0	4	0	20	80
Semester III						
SJBCA3B04	Data Structures using C	7	3	91	15	60
Semester IV						
SJBCA4B05	Database Management System and RDBMS	7	3	91	15	60
SJBCA4B06	Programming Laboratory II: Data Structures and RDBMS	0	4	0	20	80

Semester V						
SJBCA5B07	Computer Organization and Architecture	4	3	52	15	60
SJBCA5B08	Java Programming	6	3	78	15	60
SJBCA5B09	Web Programming Using PHP	6	3	78	15	60
SJBCA5B10	Principles of Software Engineering	4	3	52	15	60
SJBCS5DXX	Open Course	3	3	39	10	40
SJBCA6B17	Industrial Visit Project Work	2	0	26		
Semester VI						
SJBCA6B11	Android Programming	7	3	91	15	60
SJBCA6B12	Operating Systems	7	3	91	15	60
SJBCA6B13	Computer Networks	5	3	65	15	60
SJBCA6B14	Programming Laboratory III: Java and PHP Programming	0	4	0	20	80
SJBCA6B15	Programming Laboratory IV: Android and Linux	0	4	0	20	80

	shell Programming					
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Scheme- Common Courses

Semester I						
Course Code	Title of the course	Number of hours per week	Total Credits	Total hours/semester	Marks	
					CA	ESE
A01	Common English	5	3	65	15	60
A02	Common English	4	3	52	15	60
A07	Languages other than English	4	4	52	20	80
Semester II						
A03	Common English	5	4	65	15	60
A04	Common English	4	4	52	15	60
A08	Literature in Languages other than English	4	4	52	20	80

Scheme- General Courses

Semester III						
SJBCA3A11	Python Programming	4	4	52	20	80
SJBCA3A12	Sensors and Transducers	4	4	52	20	80

Semester IV						
SJBCA4A13	Data Communication and Optical Fibers	4	4	52	20	80
SJBCA4A14	Microprocessors Architecture and Programming	4	4	52	20	80

Scheme- Elective Courses (Choose any one stream)

Semester VI						
Course Code	Title of the course	Number of hours per week	Total Credit s	Total hours/ semester	Marks	
					C A	ES E
SJBCA6B16A	System Software	4	3	52	15	60
SJBCA6B16B	Machine Learning	4	3	52	15	60
SJBCA6B16C	Software Testing and Quality Assurance	4	3	52	15	60
SJBCA6B16D	Technical Writing	4	3	52	15	60
SJBCA6B16E	Fundamentals of Life Skill Education	4	3	52	15	60

Scheme- Complementary Courses

Semester I						
Course Code	Title of the Course	Number of hours per week	Total Credits	Total hours/ semester	Marks	
					SA	ESA
SJBCA1C01	Mathematical Foundation for Computer Applications	4	3	52	15	60

SJBCA1C02	Discrete Mathematics	4	3	52	15	60
Semester II						
SJBCA2C03	Financial and Management Accounting	4	3	52	15	60
SJBCA2C04	Operations Research	4	3	52	15	60
Semester III						
SJBCA3C05	Computer Oriented Numerical and Statistical Methods	5	3	65	15	60
SJBCA3C06	Theory of Computation	5	3	65	15	60
Semester IV						
SJBCA4C07	E-Commerce	5	3	65	15	60
SJBCA4C08	Computer Graphics	5	3	65	15	60

Scheme- Open Course (Choose any one)

Semester V						
Course Code	Title of the course	Number of hours per week	Total Credits	Total hours/ semester	Marks	
					CA	ESE
SJBCS5D01	Introduction to Computers and Office Automation	3	3	39	15	60
SJBCS5D02	Web Designing	3	3	39	15	60
SJBCS5D03	Introduction to Problem Solving and C Programming	3	3	39	15	60
SJBCS5D04	Introduction to Data Analysis using spread sheet	3	3	39	15	60

EVALUATION AND GRADING

COURSE EVALUATION

Total marks for each core, elective course is 75 and lab courses shall be **100** marks and Industrial Visit & Project Evaluation cum Programme viva- voce shall be **100** marks and open course shall be **75** marks. The evaluation scheme for each course shall contain two parts (1) Internal evaluation (2) external evaluation. 20% weight shall be given to the internal evaluation. The remaining 80% weight shall be for the external evaluation.

INTERNAL EVALUATION

The internal assessment shall be based on a predetermined transparent system involving written test, assignments, seminars and attendance in respect of theory courses and on test/record/viva/attendance in respect of lab courses. 20% of the total marks in each course (15 marks for theory, 20 marks for lab/project) are for internal examinations. The marks secured for internal assessment only need to be sent to University by the colleges concerned. Internal assessment of the project will be based on its content, method of presentation, final conclusion and orientation to research aptitude.

Components with percentage of marks of Internal Evaluation of Theory Courses are

Test paper (40%)	–	6 Marks
Attendance (20%)	–	3 Marks
Assignment (20%)	–	3 Marks
Seminar (20%)	–	3 Marks

Components with percentage of marks of Internal Evaluation of Lab Courses are

Test paper (50%)	–	10 Marks
Attendance (20%)	–	4 Marks
Assignment/Lab involvement (30%)	–	6 Marks

(if a fraction appears in internal marks, nearest whole number is to be taken)

For the test paper marks, at least one test paper should be conducted. If more test papers are conducted, the mark of the best one should be taken. To ensure transparency of the evaluation process, the internal assessment marks awarded to the students in each course in a semester shall be notified on the notice board at least one week before the commencement of external examination. There shall not be any chance for improvement for internal marks. The course teacher(s) shall maintain the academic record of each student registered for the

course, which shall be forwarded to the University by the college Principal after obtaining the signature of both course teacher and Head of the Department. The Split up of marks for Test paper and Class Room Participation (CRP) for internal evaluation are as follows.

Split up of marks for Test paper:

	Theory	Practical
85% -100%	6	10
65% -85%	5	8
55% - 65%	4	6
45% - 55%	3	5
35%- 45%	2	4
Less than 35%	1	2

Attendance of each course will be evaluated as below

	Theory	Practical
85 % and above	3	4
$75\% \leq \text{CRP} < 85\%$	2	2
$50\% \leq \text{CRP} < 75\%$	1	1

Internal evaluation for the project shall be generally based on content, method of presentation, final conclusion, and orientation to research aptitude. The split up shall be

Originality	–	4 Marks
Methodology	–	4 Marks
Scheme/Organization of Report	–	6 Marks
Viva-voce	–	6 Marks

EXTERNAL EVALUATION

There shall be University examinations for each course at the end of each semester. Practical examinations shall be conducted by the University at the end of second, fourth and sixth semesters. External evaluation of Project, Industrial Visit Report and Programme viva-voce shall be conducted along with the project evaluation at the end of the sixth semester. External evaluation carries 80% of marks, i.e., 60 marks, for each theory course.

The model of the question paper for external examination for theory courses of 2 Hours duration:

The students can answer all the questions in Sections A and B. But there shall be Ceiling in each section.

1. **Section A:** Short answer type carries 2 marks each - 12 questions (**Ceiling - 20**)
2. **Section B:** Paragraph/ Problem type carries 5 marks each - 7 questions (**Ceiling - 30**)
3. **Section C:** Essay type carries 10 marks (1 out of 2)- (**Ceiling - 10**)

The external examination in theory courses is to be conducted with question papers set by external experts. The evaluation of the answer scripts shall be done by examiners based on a well-defined scheme of valuation and answer keys shall be provided by the University. The external examination in practical courses shall be conducted by two examiners, one internal and an external, appointed by the University. The project evaluation with Programme viva voce will be conducted by two examiners, one internal and an external (appointed by the University), at the end of the sixth semester. No practical examination will be conducted in odd semester. Practical examinations for BCA Programme shall be conducted in the even semesters 2, 4 and 6.

The model of the question paper for external examination (lab courses) of 3 Hours duration shall be:

1. **Section A:** One marked question of 30 Marks from Programming Lab Part A is to be attempted (Design Algorithm/Flowchart/Interface: 10 Marks, Code: 10 Marks Result: 10 Marks. **Total 30 Marks**)
2. **Section B:** One marked question of 30 Marks from Programming Lab Part B is to be attempted (Design Algorithm/Flowchart/Interface: 10 Marks, Code: 10 Marks Result: 10 Marks. **Total 30 Marks**)
3. **Section C:** Lab viva voce (**Total 10 Marks**)
4. **Section D:** Lab Record (**Total 10 Marks**)

Number of students in one batch for practical examination must be limited to 14.

Project guidelines – Students must be encouraged to do projects in the latest tools or tools appropriate for their topic. Department should conduct monthly evaluation of the project and give necessary instructions to the students as and when required. Number of students in a project group must be limited to 4.

The scheme of evaluation for project cum Programme viva voce shall be

1. Relevance of the Topic, Statement of Objectives (**Total 15 Marks**)
2. Methodology (Reference/ Bibliography, Presentation, quality of Analysis/Use of Statistical Tools) (**Total 15 Marks**)
3. Findings and recommendations (**Total 20 Marks**)
4. Project cum Programme Viva Voce (**Total 20 Marks**)
5. Report of Industrial visit (**Total 10 Marks**)

Audit course: The students can attain only pass (Grade P) for these courses. At the end of each semester (up to fourth semester) there shall be examination conducted by the college

from a pool of questions set by the University. The students can also attain the credits through online courses like SWAYAM, MOOC etc. The College shall send the list of passed students to the University at least before the commencement of fifth semester examination.

REVALUATION

In the new system of grading, revaluation is permissible. The prevailing rules for revaluation are applicable. Students can apply for photocopies of answer scripts of external examinations. Applications for photocopies/scrutiny/revaluation should be submitted within 10 days of publication of results. The fee for this shall be as decided by the university.

COURSE IMPROVEMENT

A maximum of two courses (Common, Core, Complementary or Open) can be improved in each semester. Improvement of a particular semester can be done only once. The student shall avail the improvement chance in the succeeding year after the successful completion of the semester concerned. The internal marks already obtained will be carried forward to determine the grades/marks in the improvement examination. If the candidate fails to appear for the improvement examination after registration, or if there is no change in the results of the improvement examination appeared, the marks/grades obtained in the first appearance will be retained. Improvement and supplementary examinations cannot be done simultaneously.

EVALUATION AND GRADING

Evaluation (both internal and external) is carried out using Mark system. The Grade on the basis of total internal and external marks will be indicated for each course, for each semester and for the entire programme.

Indirect Grading System in 10-point scale is as below:

Ten Point Indirect Grading System

Example – 1 SGPA Calculation

Percentage of Marks (Both Internal & External put together)	Grade	Interpretation	Grade point Average (G)	Range of grade points	Class

95 and above	O	Outstanding	10	9.5 -10	First Class with Distinction
85 to below 95	A+	Excellent	9	8.5 -9.49	
75 to below 85	A	Very good	8	7.5 -8.49	
65 to below 75	B+	Good	7	6.5 -7.49	First Class
55 to below 65	B	Satisfactory	6	5.5 -6.49	
45 to below 55	C	Average	5	4.5 -5.49	Second Class
35 to below 45	P	Pass	4	3.5 -4.49	Third Class
Below 35	F	Failure	0	0	Fail
Incomplete	I	Incomplete	0	0	Fail
Absent	Ab	Absent	0	0	Fail
Semester I Course Code	Course Name	Grade Obtained	Grade point (G)	Credit (C)	Credit point (CXG)
xxxxxxx	Xxxxxxxx	A	8	4	32
xxxxxxx	Xxxxxxxxxx x	C	5	3	15
xxxxxxx	Xxxxxxxxxx x	A+	9	4	36
xxxxxxx	Xxxxxxxxxx x	B+	7	3	21
xxxxxxx	Xxxxxxxxxx	P	4	3	12
xxxxxxx	Xxxxxxxxxx	C	5	4	20

SGPA = Sum of the Credit points of all courses in a semester

Total Credits in that semester

SGPA = (32+15+36+21+12+20)/21=136/21

SGPA = 6.476

Percentage of marks of semester I = (SGPA/10) x 100 = 64.76 %

Note: The SGPA is corrected to three decimal points and the percentage of marks shall be approximated to two decimal points.

Example: 2

Semester II Course Code	Course Name	Grade Obtained	Grade point (G)	Credit (C)	Credit point (CXG)
xxxxxxx	Xxxxxxx	A	8	4	32
xxxxxxx	XXXXXXXXX x	C	5	3	15
xxxxxxx	XXXXXXXXX x	A+	9	4	36
xxxxxxx	XXXXXXXXX x	B+	7	3	21
xxxxxxx*	XXXXXXXXX	F	0	3	0
xxxxxxx	XXXXXXXXX	C	5	4	20

*Failed course

Note: In the event a candidate failing to secure 'P' grade in any Course in a semester, consolidation of SGPA and CGPA will be made only after obtaining 'P' grade in the failed Course in the subsequent appearance.

CGPA Calculation Example

Total Credit points obtained in six semesters

CGPA =

Total Credits acquired (120)

CGPA = $136 + 145 + 161 + 148 + 131 + 141 / 120 = 862/120$

CGPA = 7.183

Total percentage of marks = $(\text{CGPA}/10) * 100$

Total % of marks = $(7.183/10) * 100 = 71.83$

Total Credit points obtained for Core Courses

CGPA of Core Courses =

Total Credits acquired for Core Courses

Similarly CGPA of Complementary courses, Open courses, English Common courses and Additional Language Common courses may be calculated and the respective percentage may be calculated. All these must be recorded in the Final Grade Card.

CONSOLIDATED SCHEME FOR I TO VI SEMESTERS

PROGRAMME STRUCTURE

STRUCTURE OF THE PROGRAMME

SEMESTER I

COURSE CODE	COURSE TITLE	HOURS	CREDIT
A01	Common English	5	3
A02	Common English	4	3
A07	Languages other than English	4	4
SJBCA1B01	Computer Fundamentals & HTML	4	3
SJBCA1C01	Mathematical Foundation for Computer Applications	4	3
SJBCA1C02	Discrete Mathematics	4	3

SEMESTER II

COURSE CODE	COURSE TITLE	HOURS	CREDIT
A03	Common English	5	4
A04	Common English	4	4
A08	Literature in Languages other than English	4	4
SJBCA2B02	Problem Solving using C	4	3
SJBCA2B03	Programming Laboratory I: HTML and Programming in C	0	4
SJBCA2C03	Financial and Management Accounting	4	3
SJBCA2C04	Operations Research	4	3

SEMESTER III

COURSE CODE	COURSE TITLE	HOURS	CREDIT
SJBCA3A11	Python Programming	4	4
SJBCA3A12	Sensors and Transducers	4	4
SJBCA3B04	Data Structures using C	7	3
SJBCA3C05	Computer Oriented Numerical and Statistical Methods	5	3
SJBCA3C06	Theory of Computation	5	3

SEMESTER IV

COURSE CODE	COURSE TITLE	HOURS	CREDIT
SJBCA4A13	Data Communication and Optical Fibers	4	4
SJBCA4A14	Microprocessors Architecture and Programming	4	4
SJBCA4B05	Database Management System and RDBMS	7	3
SJBCA4B06	Programming Laboratory II: Data Structures and RDBMS	0	4
SJBCA4C07	E-Commerce	5	3
SJBCA4C08	Computer Graphics	5	3

SEMESTER V

COURSE CODE	COURSE TITLE	HOURS	CREDIT
SJBCA5B07	Computer Organization and Architecture	4	3
SJBCA5B08	Java Programming	6	3
SJBCA5B09	Web Programming Using PHP	6	3
SJBCA5B10	Principles of Software Engineering	4	3
XXX5DXX	Open Course	3	3

SEMESTER VI

COURSE CODE	COURSE TITLE	HOURS	CREDIT
SJBCA6B11	Android Programming	7	3
SJBCA6B12	Operating Systems	7	3
SJBCA6B13	Computer Networks	5	3
SJBCA6B14	Programming Laboratory III: Java and PHP Programming	0	4
SJBCA6B15	Programming Laboratory IV: Android and Linux shell Programming	0	4
SJBCA6B16X	Elective Course	4	3
SJBCA6B17	Industrial Visit & Project Work (Industrial Visit- 1 Credit, Project Work- 2 Credit)	2	3

SYLLABI FOR CORE COURSES

Course Code: BCA1BO1

Name of the Course: Computer Fundamentals & HTML

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)	Lab (Hrs)
CO1	Convert a given number from one system to an equivalent number in another system.	PSO1	A	P	4	4
CO2	Illustrate the construction of a binary code.	PSO1	C	P	4	4
CO3	Determine the output and performance of given combinational and sequential circuits.	PSO1	U	P	4	4
CO4	Describe the significance of different criteria for design of digital circuits.	PSO1	U	P	4	4
CO5	Compare the performances of various	PSO1	U	P	4	4

	combinational and sequential circuits.					
CO6	Able to analyse, design and evaluate digital circuits, of medium complexity.	PSO1	Z	P	4	4
CO7	Implement interactive web page(s) using HTML, CSS	PSO1	C	P	4	4
CO8	Design a responsive web site using HTML5.	PSO1	C	P	4	4

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SEMESTER I

SJBCA1B01 – Computer Fundamentals and HTML

Course Number: 4

Contact Hours per Week: 4 (2T + 2L)

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- To equip the students with fundamentals of Computer

- To learn the basics of Computer organization
- To equip the students to write algorithm and draw flow chart for solving simple problems
- To learn the basics of Internet and webpage design

Prerequisites

- Background of the basic science at +2 level

Course Outline

Unit I [5 T]

Concepts of Hardware and Software: Computer Languages, Language Translators, Features of good language, Basics Computer Organization: Von Neumann Model, Input Unit, Output Unit, Storage Unit, Control Unit, Memory Hierarchy, Primary Storage, Cache Memory, Registers, Secondary Storage Devices, Basics of Hardware Components – SMPS, Motherboard, Add-on Cards, Ports, Memory, Adapters, Network cables, Basic Computer Configuration.

Emerging Technologies: Cloud Computing, big data and data mining, industry 4.0.

Unit II [10 T]

Number Systems and Boolean Algebra – Decimal, Binary, Octal and Hexadecimal Numbers, Arithmetic involving Number Systems, Inter Conversions of Number Systems, 1's and 2's Complements, Complement Subtractions, Digital Codes – Binary Coded Decimal (BCD), ASCII Code, Unicode, Gray Code, Excess-3 Code. Boolean Algebra: Boolean Operations, Logic Expressions, Postulates, Rules and Laws of Boolean Algebra, DeMorgan's Theorem, Minterms, Maxterms, SOP and POS form of Boolean Expressions for Gate Network, Simplification of Boolean Expressions using Boolean Algebra and Karnaugh Map Techniques (up to 4 variables)

Unit III [7 T]

Fundamentals of Problem Solving – The Problem Solving Aspect, Top-down Design, Definition – Algorithm, Flowchart, Program - Properties of Flowcharts – Flowchart Symbols for Designing Application Programs, Sample Algorithms – Sum, Average, Finding Smallest Number, Checking Odd/Even Number, Prime Number, Quadratic Equation

Unit IV [5T + 16L]

Basics of Web Design – www, W3C, Web Browser, Web Server, Web Hosting, Web Pages, DNS, URL, Introduction to HTML, XHTML, DHTML, HTTP.

Overview of HTML 5 – Basic Formatting Tags: heading, paragraph, break, underline, bold, italic, superscript, subscript, font and image, attributes: align, color, bgcolor, font face, border, size,

navigation links using anchor tag: internal, external, mail and image, lists: ordered, unordered and definition, HTML media tags: audio and video

Unit V [5T+16L]

Creating Simple Tables: row, col, heading, cell, border, spanning – Form Controls: Input types – text, password, text area, button, checkbox, radio button, select box, hidden controls, frames and frame sets

CSS: Introduction - Concept of CSS, Creating Style Sheet: inline and internal, CSS Properties, CSS Styling: Background, Text Format, Controlling Fonts - Working with Block Elements and Objects, CSS ID and Class

Text Books

1. Sinha. P.K, Computer Fundamentals, BPB Publications
2. Ram. B, Computer fundamentals, New Age International Pvt. Ltd Publishers
3. Rajaraman V and Radhakrishnan, An introduction to Digital computer Design, PHI,
4. HTML 5 Blackbook, Dream Tech Press,2016 Edition

Reference Books

1. Thomas L Floyd, Digital Fundamentals, Universal Book Stall
2. Bartee T.C, Digital Computer Fundamentals, THM



MODEL QUESTION PAPER

ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

FIRST SEMESTER BCA DEGREE EXAMINATION APRIL 2020

MODEL QUESTION PAPER

SJBCA1B01 COMPUTER FUNDAMENTALS & HTML

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

- 1 Differentiate between flowchart and pseudocode?
- 2 Using the truth table prove that $X + YZ = (X + Y) \cdot (X + Z)$
- 3 What are the different steps taken by the CPU to execute an instruction?
- 4 Differentiate between even parity and odd parity
- 5 write notes on MICR
- 6 Explain about various pointing devices.
- 7 What are the advantages and limitations of flowchart?
- 8 Write an algorithm to check for leap year.
- 9 What are the different types of number systems?
- 10 Apply DeMorgan's theorem in the expression $AB(C+D)$
- 11 What is cache memory?
- 12 What are the different types of memory?

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

- 13 Write the ASCII-8 coding for the word RAJU in both binary and hexadecimal notations. How many bytes are required to store this word using the same coding?
- 14 Express the Boolean function $x \cdot y + \bar{z}$ in product of sums canonical form
- Explain, how cache memory helps in improving the speed of a computer?
- 16 Simplify the Boolean function $F(A, B, C, D) = \sum(3, 7, 11, 13, 14, 15)$.
- 17 Decode the code word 1110110 created using Hamming code.
- 18 Construct the logic circuit diagram for Exclusive – OR function using NAND gates only.
- 19 Design a full – adder combinational circuit.

SECTION C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

- 20 Explain how data can be stored and accessed on a magnetic disk?
- 21 Write short notes on :

- (a) Measuring storage capacity of a computer.
- (b) Various logic gates used to construct circuit diagrams.

SYLLABI FOR COMPLEMENTARY COURSES

Course Code: BCA1CO1

Name of the Course: Mathematical Foundation for Computer Applications

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Understand the basic principles of linear algebra and vectors.	PSO3	U	F	13
CO2	Understand the basic principles of differential and integral Calculus.	PSO3	U	F	13
CO3	Illustrate the Mathematical modeling using ordinary and partial equations.	PSO3	A	C	13
CO4	Familiarize with different operations on matrices.	PSO3	U	F	13
CO5	Understand the limits of functions.	PSO3	U	F	12

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***F-factual, C-conceptual, P-practical/procedural**

BCA1C01 – Mathematical Foundation for Computer Applications

Course Number: 5

Contact Hours per Week: 4

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- To learn the basic principles of linear algebra and vectors.
- To learn the basic principles of differential and integral Calculus.
- To learn mathematical modeling using ordinary and partial equations.

Prerequisites

- Basic mathematical knowledge

Course Outline

UNIT I (12T)

Linear Algebra and Vector Calculus: Matrices: Matrix definition, order of a matrix, types of matrices, addition of matrices, multiplication of matrices, various kinds of matrices, transpose of a matrix.

UNIT II (12T)

Linear system of equations and solutions using gauss elimination , Gauss Jordan, and Gauss Siedel methods.

Linear independence and rank , determinants, inverse, Eigen values. Vectors: Vectors in 2- and 3-space, dot and cross products.

UNIT III (14T)

Differentiation: Limits (definition only).Derivative at a point, Derivative of a Function, Differentiation from first principle, Differentiation of important functions, Product rule, Quotient rule, Differentiation of a function of a function (problem based)

UNIT IV (12T)

Integration: Integral as Anti-derivative, Indefinite integral & constant of integration, Fundamental theorems, Elementary Standard results.

UNIT V (14T)

Methods of Integration, Integration through Partial Functions , Integration by parts. Definite Integral: Evaluation by Substitution, Properties of definite integrals (Problem Based)

Textbooks

1. Advanced Engineering Mathematics, Erwin Kreyszig, Wiley

References:

1. Higher Engineering Mathematics, John Bird, Elsevier Direct
2. Skills in Mathematics: Algebra, S.K.Goyal
3. Higher Engineering Mathematics, B S Grewal, Khanna Publishers
4. Higher Engineering Mathematics, Ramana, Tata McGraw Hill
5. Engineering Mathematics, P Kandasamy, S. Chand Group

MODEL QUESTION PAPER

Name.....

Reg.No.....

FIRST SEMESTER BCA DEGREE EXAMINATION NOVEMBER 2019 (CBCSS-UG)

Complementary Course – BCA1C01 – MATHEMATICAL FOUNDATION FOR COMPUTER APPLICATIONS

Time: 2 Hours

Maximum: 60 Marks

Section A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. Find k if $A = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ is singular.
2. If A is non-singular, then show that $(A^{-1})^{-1} = A$
3. Define diagonal matrix.
4. Find p if $\vec{r} = -2i - pj + k$ and $\vec{s} = i + j - 3k$ are orthogonal.
5. Find λ and μ if $(2i + 6j + 27k) \times (i + \lambda j + \mu k) = \vec{0}$
6. Find the derivative of $x^2 \cos x$.
7. If A is an orthogonal matrix, prove that $|A| = \pm 1$
8. Find the derivatives of all orders of $\sin(x)$
9. Write a 3×2 matrix $A = \begin{bmatrix} a & b \\ c & d \\ e & f \end{bmatrix}$ if $A^T A = I$
10. $\frac{d}{dx} \sin(x) =$
11. Find $|a|$ and $|b|$ if $(a+b)(a-b) = 3$ and $2|b| = |a|$
12. $\int \frac{1}{x^2} dx =$

Section B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Find the derivative of $\sin(x)$

14. Find the value of $\int \frac{\sqrt{x}}{\sqrt{x} + \sqrt{1-x}} dx$
15. Find the area of triangle with vertices A(1,1,2) , B(2,3,5) , C(1,5,5)
16. If $f(x) = \sin 2x$, find $f'(x)$ –
17. Prove that $\int_0^1 x^2 dx = \int_1^0 -x^2 dx = -$
18. Find the angle between the vectors $\vec{r} = i - j + k$ and $\vec{r} = 2i + k$
19. Find the eigen values of $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$

SECTION C – Essay type questions

(Answer any one question, correct answer carries 10 marks)

20. Find the Eigen vectors of the matrix $A = \begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$
21. Evaluate (i) $\int_0^1 x^2 dx$ (ii) $\int_0^1 dx$

Course Code: BCA1CO2

Name of the Course: Discrete Mathematics

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Understand mathematical logic and Boolean algebra.	PSO3	U	F	10
CO2	Understand the basic principles of sets and operations in sets.	PSO3	U	F	10
CO3	Demonstrate an understanding of relations and functions and be able to determine their properties.	PSO3	U	F	11
CO4	Explain Ordered sets & Lattices	PSO3	U	F	11
CO5	Evaluate Boolean functions and simplify expression using the properties of Boolean algebra;	PSO3	E	F	11
CO6	Understand some	PSO3	U	C	11

	basic properties of graphs and related discrete structures, and be able to relate these to practical examples				
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***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA1C02 – Discrete Mathematics

Course Number: 6

Contact Hours per Week: 4

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- To learn mathematical logic and Boolean algebra.

Prerequisites

- Basic mathematical knowledge

Course Outline

UNIT I (12T)

Mathematical Logic: Propositions and logical operators, Truth tables, equivalence and implementation, Laws of logic, Quantifiers.

Set theory: Introduction, concept of set of theory relation, types of relation, equivalence relation.

UNIT II (12T)

Boolean Algebra and its properties, Algebra of propositions & examples, De-Morgan's Laws, Partial order relations, greatest lower bound, least upper bound, Algebra of electric circuits & its applications. Design of simple automatic control system

UNIT III (14T)

Graph: Simple and multigraph, Incidence and degree, Isomorphism, Sub graphs and Union of graphs, connectedness, Walks, Paths and Circuits, Euler's Formula, Eulerian graph, Hamiltonian

graph, Chromatic Graphs, Planer Graphs, Travelling salesman problem, Complete, Regular and Bipartite graphs, Directed Graphs

UNIT IV (14T)

Trees: Properties of trees, pendant vertices. Centre of a tree, rooted and binary trees, spanning trees, spanning tree algorithms, fundamental. circuits; spanning trees of a weighted graph: cutsets and cut-vertices; fundamental cutsets; connectivity and separativity; network. flows; max-flow min-cut theorem.

UNIT V (12T)

Plan on graphs, dual graphs, Kuratowski's two graph, matrix representation of graphs, incidence matrix, directed graphs, digraphs, directed paths and connectedness. Euler digraphs

Textbooks

1. Discrete Mathematical Structures with applications to Computer Science, J.K. Tremblay and R.Manohar, McGraw Hill

References:

1. Elements of Discrete Mathematics, C. L. Liu, TMH Edition
2. Discrete mathematical Structures, Kolman, Busby, Ross, Pearson
3. Graph theory, Harry, F., Addison Wesley.
4. Finite Mathematics, S. Lipchutz, Schaum Series, MGH.
5. Graph Theory, Deo. N, PHI

MODEL QUESTION PAPER

Name.....

Reg.No.....

FIRST SEMESTER BCA DEGREE EXAMINATION NOVEMBER 2019 (CBCSS-UG)

Complementary Course – SJBCA1C02 – DISCRETE MATHEMATICS

Time: 2 Hours

Maximum: 60 Marks

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. What do you mean by connectives ? Draw truth tables for each connective
2. Construct truth table for $\sim(p \vee q)$.
3. Give an example of a relation which is reflexive ,transitive but not symmetric
4. What is a cycle? Explain with example.
5. Show that in any graph, the number of vertices of odd degree is even.
6. Draw K_4 as planar and write the number of faces for this graph.
7. Define propositions, and compound propositions.
8. What do you mean by equivalence relation?
9. Write about the radius of a graph.
10. What is a bipartite graph?
11. Define tree with example.
12. What is a regular graph ? Give an example.

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Prove that every tree is a bipartite graph.
14. Let G be a graph in which the degree of the vertices is at least 2. Then show that G contains a circuit.
15. Write Kruskal's algorithm.
16. What is isomorphism? Explain with example.

17. What is Boolean algebra? Write its properties.
18. Let $A = \{1, 2, 3, 4\}$. Derive relations (R1: reflexive, R2: irreflexive, R3: symmetric, R4: antisymmetric, R5: transitive) from A.
19. What is a Hamiltonian graph? Discuss with example.

SECTION C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

20. Prove that connected graph G with at least two vertices contains at least two vertices that are not cut vertices.
21. Write Prim's algorithm for finding spanning tree and explain it with example

SYLLABI FOR CORE COURSES

Course Code: BCA2BO2

Name of the Course: Problem Solving using C

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)	Lab (Hrs)
CO1	Understand the problem and identify the tools and programming structure to logically solve the problem.	PSO3, PSO4	U	P	5	5
CO2	Understand the basic concepts of programming language C including variables and operators.	PSO3, PSO4	U	P	5	5

CO3	Choose appropriate conditional and iteration constructs for a given programming task.	PSO3,PSO4	C	P	6	5
CO4	Apply the techniques of structured (functional) decomposition to break a program into smaller pieces.	PSO3,PSO4	A	P	6	5
CO5	Understand memory management using pointers	PSO3,PSO4	U	P	6	5
CO6	Design, implement, test, and debug a program that uses each of the following fundamental programming constructs: basic computation, simple I/O, standard conditional and iterative structures, and the definition of functions.	PSO3,PSO4	E	P	6	5

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA2B02 – Problem Solving Using C

Course Number:10

Contact Hours per Week: 4(2T+2L)

Number of Credits: 3

Number of Contact Hours: 64Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To equip the students with fundamental principles of Problem Solving aspects.
- To learn the concept of programming
- To study C language
- To equip the students to write programs for solving simple computing problems

Prerequisites

- Knowledge of basic computer operations

Course Outline

Unit I [4T+ 4L]

Introduction to C Programming - Overview and Importance of C, C Program Structure, Sample programs.

Familiarization of Integrated Development Environment - Invoking IDE, Opening a new window in IDE, Writing, Saving and Compiling a C program, making an Executable File.

Elements of C Language and Program Constructs: Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable Declaration and Assignment of Values, Symbolic Constant Definition.

Unit II [4T+ 6L]

C Operators - Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations - Library functions.

Unit III [4T + 10L]

Data input output functions - Simple C programs – Flow of Control - Decision making with IF statement, Simple IF statement, If-else statement, Nesting of If-else and else-if Ladder, Switch statement, Conditional operator, goto statement. Looping - While loop, Do-While, and For Loops, Nesting of loops, jumps in loop, skipping of loops.

Unit IV [6T+ 10L]

Arrays and Strings - One dimensional array, two dimensional and multi-dimensional arrays, strings and string manipulation functions. Structures & Union structure definition - giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, bit fields.

Unit V [6T+ 10L]

Pointers - Understanding pointers, accessing the address of a variable, declaring and initializing pointers, accessing a variable through its pointer, pointer expressions, pointer and arrays, pointer and character string, pointers and functions, pointers and structures, pointer to pointer dynamic memory allocation. Files: Creating, Processing, Opening and Closing a data file, command line operations

The Concept of modularization and User defined functions - Definition - Multifunction Program, proto-types, Passing arguments, calling functions, various categories of functions, Nesting of functions and recursion, functions and arrays, scope and lifetime of variables in functions, multi-file programs

Textbook:

1. Balaguruswami. E, Programming in ANSI C, Tata McGraw-Hill Education, 2008

References

1. Brian W. Kernighan & Dennis M. Ritchie, The C Programming Language, Prentice Hall, 2nd Edition 1998
2. Yashavant P. Kenetkar, Let us C
3. ByranGotfried, Schaums Outline series Programming with C
4. Ashok N. Kamthane, Programming in C, Pearson, 2nd Edition

MODEL QUESTION PAPER

Name.....

Reg.No.....

SECOND SEMESTER BCA DEGREE EXAMINATION APRIL 2020 (CBCSS-UG)

Core Course – COMPUTER SCIENCE: SJBCA2B02 – PROBLEM SOLVING USING C

Time: 2 Hours

Maximum: 60 Marks

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

- 1.How will you define a symbolic constant?
- 2.Differentiate between the constants „A“ and “A”
- 3.What is an identifier? Give examples
4. What is a register variable?
5. What is the purpose of return () statement?
6. How will you read a string using scanf() function?
7. What is a pointer? How will you access a variable through its pointer?
8. What is a conditional operator? Explain with example.
- 9.What is a structure?
10. Differentiate between actual and formal parameters with example
11. What is meant by type casting?
12. What is meant by dynamic memory allocation?

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Write a program to find the length of a string using pointer
14. What are arrays? How are arrays defined? Illustrate with example.
15. Describe the switch statement with example

16. What is a function? What are its advantages?
17. Explain the jumping statements in C with examples
18. Which are the file handling functions?
19. Differentiate between call by value and call by reference with suitable examples

Course Code: BCA2BO3

Name of the Course: Programming Laboratory I: Lab Exam of 1st & 2nd Semester - HTML and Programming in C

**SJBCA2B03 - Programming Laboratory I: Lab Exam of 1st & 2nd Semester -
HTML and Programming in C**

Course Number: 11

Number of Credits: 4

Course Evaluation: Internal – 20 Marks + External – 80 Marks

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)	Lab (Hrs)
CO1	Make the students learn web designing	PSO4	A	P	0	0
CO2	Make the students learn programming environments.	PSO4	C	P	0	0
CO3	Practice procedural programming concepts.	PSO4	A	P	0	0
CO4	Make the students equipped to solve mathematical or scientific problems using C	PSO4	C	P	0	0

- To make the students learn web designing
- To make the students learn programming environments.
- To practice procedural programming concepts.
- To make the students equipped to solve mathematical or scientific problems using C

Prerequisites

- Knowledge in operating computer.
- Knowledge in Computer fundamentals.

Course Outline:

Part A: HTML lab work

List of Exercises:

- 1) Design a web page to display the information of Computer Science department of your college by using basic page tags. Display the information in the form of paragraphs/sentences. Also use effects to highlight the information like bold, italic or underline.
- 2) (a) Create a webpage with HTML describing your department. Use paragraph and list tags.
(b) Apply various colors to suitably distinguish key words. Also apply font styling like italics, underline and two other fonts to words you find appropriate. Also use header tags.
- 3) Use the above webpage to
 - a) Create links on the words e.g. “Wi-Fi” and “LAN” to link them to Wikipedia pages.
 - b) Insert an image and create a link such that clicking on image takes user to other page.
 - c) Change the background color of the page. At the bottom create a link to take user to the top of the page.
- 4) Design a page to display the information in table format. Display the list of colleges offering B.Sc. Computer Science along with the details College Name, Address, Contact no. Address column will consist of sub columns as House Name, Post, City and pin code.
(Purpose: - Introduction of table tags along with the sub columns and other supportive tags like caption, cell spacing, cell padding etc.)
- 5) Create a webpage to create a photo Album. When the user clicks on the Image and Video Link it should open the corresponding album.
- 6) Design web pages which display the product images and its information with it. The products are computer, printers and laptop. The information displayed of product should be configuration/ technical details, price etc.
(Purpose: - Study image tag. Display image in tabular form along with the other text information.)
- 7) Design a page to display the B.Sc. Computer Science syllabus by using Listtag.
(Purpose: - Introduce list tag to display data in ordered or unordered format as main, sub main, sub-sub main, etc by using nos. or special types of bullets.)
- 8) Create HTML pages using Hyper Links

- i. File Link
 - ii. Single Page Link
- 9) Create a hyperlink to show the information and syllabus of B.Sc. Computer Science. When click on the links each page should display the objective of respective course, Lesson plan, Course duration etc.
(Purpose: - Introduce anchor tag to create links between pages. One can able to transfer the control to next page, previous page or to a specific page like Home page.)
- 10) Design an HTML page describing your University infrastructure. Use tables to provide layout to your HTML page.
- 11) Use `` and `<div>` tags to provide a layout to the above HTML page instead of a table layout.
- 12) HTML pages with Tables
- i. Use Tables to layout HTML pages
 - ii. Use `` and `<div>` tags to provide a layout to the above page instead of table layout
 - iii. Use Frames to divide the page contents into different parts
 - iv. Embed Audio and Video into your HTML webpage
- 13) Design a page to display the information in table format. Display the list of colleges offering Computer Science along with the details College Name, Address, Contact no. Address column will consist of sub columns as Post Office, City, District and Pin code.
(Purpose: - Introduction of table tags along with the sub columns and other supportive tags like caption, cell spacing, cell padding etc.)
- 14) Create an HTML page to show the use of Navigation Frame
- 15) Create an HTML page to show the use of Floating Frame
- 16) Create an HTML page to show the use of Inline Frame
- 17) Design web pages to display the information about your college and UG Programmes offered in your college. Divide the page into three frames. The top frame should display the title of the college, left frame should display the UG Programmes and the right frame display the details of selected programme like fees, syllabus etc.
(Purpose: - Study frame tag which allow to divide the screen into no of sections.)
- 18) Design web pages to accept the student information. Student should enter the details like first name, last name, middle name, city up to 25 characters, and address up to 50 characters. Show

the combo box to select the qualification, option button for gender selection. Display the information accepted in a formatted form.

(Purpose: - Study form tag which allow to design the formatted screen to accept the information from the user.)

19) Design a website to show the use of the following input controls

- i. Checkbox,
- ii. Radio button,

20) Design a website to show the use of the following input controls

- i. Select box,
- ii. Hidden controls

21) Design CSS style sheet to define settings for heading, body, table and links.

(Purpose: - Study CSS style sheet facility. This allows setting the default settings for all the pages.)

22) Design a webpage to show the use of External Style Sheets

Part B: C Programming

Write programs to do the following:

1. Find the sum of digits and reverse of a number.
2. Find the distance between two points.
3. Find the factorial of a number.
4. Find the Nth Fibonacci number using recursion.
5. Print the reverse of a string using recursion.
6. Solve the problem of Towers of Hanoi using recursion.
7. Find Sin(x) and Cos(x) in the range 0° to 180° (interval 30°) using functions.
8. Create a pyramid using „*“.
9. Display the multiplication tables up to the number N.
10. Find the number of words in a sentence.
11. Perform matrix addition, subtraction, multiplication, inverse, and transpose using pointers and functions.
12. Replace a part of the string with another string.
13. Find the power of a number using structure and union.
14. Find the average of prime numbers in a group of N numbers using function.
15. Find the sum of the series $S = 1 + (1/2)^2 + (1/3)^3 + \dots$ to 0.0001% accuracy.
16. Display the rightmost digit in a floating point number.
17. Create a pattern with the number N.

e.g. N = 39174 Pattern:

3	9	1	7	4
9	1	7	4	
1	7	4		
7	4			
4				

18. Display the short form of a string. E.g. Computer Science : CS
19. Currency conversion (any four currencies)
20. Find the currency denomination of a given amount.
21. Prepare sales bill using array of structures.

22. Addition and subtraction of complex numbers using structure.
23. Find the armstrong numbers within a given range.
24. Check for palindrome string/number.
25. Check for leap year.
26. Find the number of special characters in a given string.
27. Store and read data from a text file.
28. Write odd and even numbers into separate files.
29. Swapping of two numbers using call-by-reference method.
30. Copy the contents of one file into another one using command line parameters.
31. Base conversion of numbers.
32. Calculate the percentage of marks obtained for N students appeared for examination in M subjects using array of structures.
33. Display a table of the values of function $y = \exp(-x)$ for x varying from 0.0 to N in steps of 0.1
34. Design a Scientific Calculator and include as many functions as possible.
35. Merge two numeric arrays in sorted order.
36. Fill upper triangle with 1, lower triangle with -1 and diagonal elements with 0.
37. Count the occurrence of different words in a sentence.
38. Convert an input amount into words.
39. Convert a time in 24 hour clock to a time in 12 hour clock using structure.
40. Change the date/time format using structure

Include any 15 HTML programs and 20 C programs in the record book.

Note: All lab works should be neatly recorded in a Laboratory Record Book in written form. However Program results can be pasted in the left hand side of the fare record. All students should have a rough record (observation note book) too, in which they write all the works to be carried out in the lab prior to his/her entering the lab. He/She may also note down the i/p and o/p that he gives for program verification in the observation note book (rough record).

SYLLABI FOR COMPLEMENTARY COURSES

Course Code: BCA2CO3

Name of the Course: Financial and Management Accounting

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	To enable the students for acquiring basic knowledge in accounting	PSO3	U	F	13
CO2	To equip the students with the skills of preparing final accounts of sole traders	PSO3	C	C	13
CO3	To enable the students to understand the concept and relevance of Management Accounting.	PSO3	U	F	13

CO4	To provide the students a general understanding on various tools for financial statement analysis.	PSO3	U	C	13
CO5	To enable the students to get a general understanding on the important tools for managerial decision making	PSO3	U	C	12

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA2C03 – Financial and Management

Accounting Course Number:12

Contact Hours per Week: 4

Number of Credits: 3

Number of Contact Hours: 64Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To get a general introduction on accounting and its general applications.
- To get an understanding on various tools for financial statement analysis.
- To get an understanding on accounting procedures upto the preparation of various financial statements.
- To get a general understanding of the important tools for managerial decision making.

Prerequisites

- Basic accounting knowledge.

Course Outline

UNIT I (12T)

Principles of accounting - Some fundamentals concepts and conventions - Systems of accounting double entry principles - Advantages of Double entry system - personal, real, nominal accounts.

UNIT II (12T)

Cash book - forms of cash books - subdivisions of Journal - Ledgers - limitations of financial accounting - Trial balance - Final accounts - Trading P/L A/c - Balance sheet

UNIT III (12T)

Invitation to management accounting: Analysis and interpretation of trading accounts and financial statements - Horizontal Vertical analysis - Common size Balance sheet - common size income statement - comparative income and balance sheet - trend analysis.

UNIT IV (12T)

Marginal costing - Breakeven point - cost volume profit analysis - margin of safety

UNIT V (12T)

Standard costing - analysis of variance - material - labour - O/H - sales variables - Budget and Budgetary control - different types of budgets - master budget - sales budget - production budget - flexible budget - cash budget - advantages – preparation

Textbooks

1. Financial Management, Pandey I.M Vikas publishing house

References:

1. Elements of Accounting, Kellock.J, Heinmann
2. Advanced Accountancy, S.N Maheshwari, Vikas Publishing

3. Cost and Management Accounting, A.Vinod, Calicut University Central
Co-Operative Stores

Name.....

Reg.No:.....

**ST. JOSEPH'S COLLEGE (AUTONOMOUS), IRINJALAKUDA
SECOND SEMESTER DEGREE EXAMINATION
PROGRAMME- BCA
SJBCA2C02 - FINANCIAL AND MANAGEMENT ACCOUNTING**

Time: 2 Hours

Max. Marks: 60

PART A

Answer all. Each carries 2 marks.

1. What is trading account?
2. What do you mean by BEP?
3. Define marginal costing.
4. What do you mean by wasting assets?
5. What do you mean by angle of incidence?
6. How do you treat prepaid expenses in final accounts?
7. Mention any two limitations of Management Accounting.
8. What is short term Analysis?
9. What is Cash Book?
10. What do you mean by internal analysis?
11. Define Accounting.
12. What do you mean by contingent assets?

(Max. Ceiling: 20 marks)

PART B

Answer all. Each carries 5 marks.

13. Explain rules of accounting
14. Briefly explain the types of cashbook
15. Define Budgetary control and explain its objectives
16. The standard cost card shows the following details relating to the materials:
Standard Price Rs.1 per unit
Standard Quantity 4000 units
Actual Price Rs 1.25 per unit
Actual usage of material 4100 units

Calculate:

- (1) Material Cost Variance (2) Material Price Variance (3) Material Usage Variance

17. Prepare a columnar petty cash book on imprest system

2014

April 1 Cash received from chief cashier Rs.300

April 2 Paid Postage Rs.40

April 5 Paid stationery Rs.25

April 8 Paid Wages Rs. 100

April 15 Paid travelling Expenses Rs.20

April 25 Paid telegram Rs.10

18. What is balance sheet? Explain the need and importance of it?

19. What are characteristics and assumptions of marginal costing.

Sales Rs. 1, 00,000

Variable cost Rs. 60,000

Fixed cost Rs. 30,000

Find out: (1) P/V Ratio, (2) BEP, (3) Sales required to earn a profit of Rs. 20,000.

(Max.Ceiling: 30 Marks)

PART C

Answer any one Question. Each carries 10 Marks

20. The following trial balance is extracted from the book of a merchant on 31st Dec 2013,
Prepare final accounts.

Furniture and Fittings	640	
Motor Vehicle	6,250	
Buildings	7,500	
Capital account		12,500
Bad debts	125	
Provision for bad debts		200
Sundry debtors and creditors	3,800	2,500
Stock on Jan 1- 2013	3,460	
Purchase and Sales	5,475	15,450
Bank overdraft		2,850
Sales and Purchase Returns	200	125
Advertising	450	
Interest on bank overdraft	118	
Commission		375
Cash	650	
Taxes and Insurance	1,250	
General expenses	782	
Salaries	3,300	

The following adjustments are to be made:

(1) Stock in hand on 31st dec 2013 was Rs. 3,250

(2) Depreciate building @ 5%, furniture and fittings @10% and Motor Vehicle @ 20%.

(3) Rs. 85 is due on interest on bank overdraft.

Bachelor of Computer Applications, St. Joseph's College (Autonomous), Irinjalakuda

- (4) Salaries Rs. 300 and taxes Rs. 120 are outstanding.
- (5) Insurance amounting to Rs. 100 is prepaid.
- (6) One third of the commission received is in respect of work to be done next year.
- (7) Write off further sum of Rs. 100 as bad debt and provision for bad debts equal to 10% on sundry debtors.

21. Explain accounting principles.

(1x10 marks=10 marks)

Course Code: BCA2CO4

Name of the Course: Operations Research

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Understand a general introduction in solving linear programming problems.	PSO3	U	F	12

CO2	Understand the mathematical tools that are needed to solve optimization problems	PSO3	U	F	13
CO3	General understanding of network analysis technique.	PSO3	U	F	13
CO4	General understanding of different mathematical models.	PSO3	U	F	13

CO5	Understand how to translate a real-world problem, given in words, into a mathematical formulation	PSO3	U	C	13
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***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA2C04 - Operations Research

Course Number: 13

Contact Hours per Week: 4

Number of Credits: 3

Number of Contact Hours: 64Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To get a general introduction in solving linear programming problems.
- To get a general understanding of network analysis technique.
- To get a general understanding of different mathematical models.

Prerequisites

- Basic Mathematical knowledge

Course Outline

UNIT I (12T)

Operation research and LPP: Operation Research and Decision making, Advantages of O.R approach in decision making, Application of O.R, uses and limitations of O.R.

UNIT II (14T)

LPP: Introduction, mathematical formulation the problem, canonical and standard forms of LPP. Simplex method, artificial variable technique - Big M and two phase method - problem of degeneracy - concept of duality - dual simplex method.

UNIT III (12T)

Transportation model - North West corner rule, Least cost method, Vogel's approximation method - loops in transportation table - Degeneracy in transportation table - Transshipment problem.

UNIT IV (12T)

Assignment model: Mathematical formulation of the problem - assignment algorithm impossible algorithms - travelling salesman problem

UNIT V (14T)

Network Scheduling: Concept of network, basic components, PERT and CPM, Rules of network construction, maximal flow problem, project scheduling critical path calculations, advantages of network (PERT/CPM).

Sequencing models: processing n jobs through two machines, n jobs through three machines, two jobs through m machines.

Textbook

1. Operation Research, Kanti Swarup, Gupta P.K Man Mohan, Sultan Chand & Sons

References:

1. Operation Research: An Introduction, Tahah. A, McMillan 1982
2. Operations Research, Prof. K. Venogopal, Calicut University Central Co-Operative Stores

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA
SECOND SEMESTER BCA DEGREE EXAMINATION APRIL 2020

MODEL QUESTION PAPER
SJBCA2C04 OPERATIONS RESEARCH

Time: 2 Hours

Maximum: 60 Marks

Section A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

- 1 What is a loop in transportation problem?
- 2 Write a short note on slack and surplus variable.
- 3 What is a critical path?
- 4 Explain (i) Merge event
a. (ii) Burst event
- 5 Explain the terms in the transportation problem
(i) Feasible solution (ii) Basic feasible solution (iii) Optimum solution
- 6 Write the difference between Transportation problem and assignment problem.
- 7 What is critical path and write any two limitations of critical path method.
- 8 What is Assignment Problem
- 9 Write the canonical form of LPP
- 10 Define Simplex Method
- 11 What are the basic components of LPP
- 12 What are the limitations of operation research?

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

19. Solve the following LPP graphically
Maximize Subject
to

20. Express in standard form:

Maximize
Subject to

21. Solve the transportation problem by Least Cost Method

					Supply
	2	3	11	7	6
	1	0	6	1	1
	5	8	15	9	10
Demand	7	5	3	2	17

22. Explain the two –phase method of solving linear programming problem.

23. Explain the steps involved in PERT calculations.

24. Solve the following assignment problem

	I	II	III	IV
	12	30	21	15
	18	33	9	31
	44	25	24	21
	23	30	28	14

25. Write the difference between CPM and PERT

SECTION C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

28. Solve by simplex method

Maximize

Subject to

29. Construct the network diagram and identify the critical path and find the minimum time of completion of the project when time is in days of each task is as follows

Activity	1-2	1-3	1-4	2-4	2-6	3-5	3-6	4-5	5-6
Duration	8	8	10	10	16	18	14	17	9

SEMESTER THREE

Course Code: SJBCA3A11

Name of the Course: Python Programming

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Learn Python programming Environment and basic design constructs.	PSO1	U	F	10
CO2	Understand the decision and repetition structures in program design.	PSO1	U	F	8

CO3	Apply functions and files to improve the efficiency of the programs.	PSO1	A	F	10
CO4	Implement exception handling and Object oriented programming methodology.	PSO1	C	F	10
CO5	Represent and visualize data	PSO1	U	F	10
CO6	Implement object oriented concepts,	PSO1	C	F	8
CO7	Implement database and GUI applications.	PSO1	C	F	8

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA3A11– Python Programming

Course Number: 14

Contact Hours per Week: 4T

Number of Credits: 4 Number of

Contact Hours: 64

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Outcome of the Course:

- Understand various statements, data types and functions in Python
- Develop programs in Python programming language
- Understand the basics of Object oriented programming using Python

Objectives of the Course:

- To learn basics of Python programming
- To learn decision making, looping and functions in Python
- Understand Object Oriented Programming using Python

Prerequisites:

- Knowledge of C language.

Course Outline

UNIT I [16T]

Introduction to python, features, IDLE, python interpreter, Writing and executing python scripts, comments, identifiers, keywords, variables, data type, operators, operator precedence and associativity, statements, expressions, user inputs, type function, eval function, print function.

UNIT II [16T]

Boolean expressions, Simple if statement, if-elif-else statement, compound boolean expressions, nesting, multi way decisions. Loops: The while statement, range functions, the for statement, nested loops, break and continue statements, infinite loops.

UNIT III [16T]

Functions, built-in functions, mathematical functions, date time functions, random numbers, writing user defined functions, composition of functions, parameter and arguments, default parameters, function calls, return statement, using global variables, recursion.

UNIT IV [16T]

String and string operations, List- creating list, accessing, updating and deleting elements from a list, basic list operations. Tuple- creating and accessing tuples in python, basic tuple operations. Dictionary, built in methods to access, update and delete dictionary values. Set and basic operations on a set.

References:

1. E. Balaguruswamy, Introduction to Computing and Problem Solving Using Python
2. Richard L. Halterman, Learning To Program With Python
3. Martin C. Brown, Python: The Complete Reference.

MODEL QUESTION PAPER



**ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA
THIRD SEMESTER BCA DEGREE EXAMINATION APRIL 2020**

MODEL QUESTION PAPER

SJBCA3A11: PYTHON PROGRAMMING

TIME: 2 1/2 HOURS

MAX: 80 MARKS

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 25 marks)

- 1 What is IDLE?
- 2 Expressions, and Variables in Python programming language
- 3 Explain the basic data types available in Python .
- 4 Write Python Program to reverse a number
- 5 write notes on compound boolean expressions.
- 6 Explain if-elif-else statement
- 7 What is recursion.?
- 8 Differentiate identifiers and keywords.
- 9 Explain built in functions.
- 10 Explain the concept of scope and lifetime of variables in Python programming .
- 11 Explain function call?
- 12 What is tuple?how to create and access tuple in python.
- 13 What is break statement ?
- 14 Define set
- 15 What is nested loop?

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 35 marks)

- 16 Discuss the int(), float(), str(), chr() and complex() type conversion functions with examples .
- 17 Explain operator precedence and associativity .
- 18 Illustrate the different types of control flow statements available in Python .
- 19 Explain mathematical functions, date time functions.
- 20 Differentiate Simple if statement, if-elif-else statement with an example.

- 21 How to update and delete dictionary values.
- 22 Explain ring operations
- 23 Explain set operations with example

SECTION C – Essay type questions
(Answer any two question. Correct answer carries 10 marks)

- 24 Explain while loop and for loop with suitable example.
- 25 Explain Strings and string operations
- 26 Explain functions and function composition with example
- 27 Explain tuple and operations in python

Course Code: SJBCA3A12

Name of the Course: Sensors and Transducers

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Develop professional skills in acquiring and applying the knowledge outside the classroom through design of a real-life instrumentation system.	PSO2	C	F	8

CO2	Classify and explain with examples of transducers, including those for measurement of temperature, strain, motion, position and light.	PSO2	U	F	8
CO3	Use concepts in common methods for converting a physical parameter into an electrical quantity and predict correctly the expected performance of various sensors.	PSO2	Z	F	8
CO4	Locate different type of sensors used in real life applications and paraphrase their importance.	PSO2	A	F	8
CO5	Learn the various types of level measurement transducers and their applications, basic principle of working.	PSO2	U	F	8
CO6	Understand principle of working of various transducers used to measure Temperature, comparative study of various transducers and applications of various transducers in industry and other miscellaneous sensors.	PSO2	U	F	8

CO7	Choose proper sensor comparing different standards and guidelines to make sensitive measurements of physical parameters like pressure, flow, acceleration, etc.	PSO2	Z	F	88
CO8	Set up testing strategies to evaluate performance characteristics of different types of sensors and transducers and develop professional skills in acquiring and applying the knowledge outside the classroom through design of a real-life instrumentation system.	PSO2	E	F	8

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA3A12 - Sensors and Transducers

Course Number: 20

**Contact Hours per
Week: 4T Number of
Credits: 4**

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Course Outcome

The students will be able to

- Explain resistance, inductance and capacitance transducers.
- Perceive the concepts of temperature and pressure transducers.
- Perceive the concepts level transducers such as and flow transducers
- Explain Electromagnetic transducers and radiation sensors
- Explain force and torque transducers and sound transducers

Course Outline

Unit I [16 T]

Transducers: Definition, Principle of sensing & transduction, Classification, Characteristics of transducers. Basic requirement of transducers.

Resistance Transducer: Basic principle – Potentiometer –Loading effects, Resistance strain gauge– Types.

Inductance Transducer: - Basic principle – Linear variable differential transformer – RVDT- types. Capacitance Transducer: Basic principle- transducers using change in area of plates – distance between plates- variation of dielectric constants –Types

Unit II [16 T]

Thermal sensors: Resistance change type: RTD - materials, construction, types, working principle, Thermistor - materials, construction, types, working principle, Thermo emf sensors: Thermocouple – Principle and types, Radiation sensors: Principle and types.

Pressure Transducers: basic principle- different types of manometers-u tube manometer-well type manometers.

Unit III [16 T]

Level transducer-continuous level measurement-discrete level measurement-mass – capacitive level gauges

Flow Transducers: Bernoulli's principle and continuity, Orifice plate, nozzle plate, venture tube, Rotameter, anemometers, electromagnetic flow meter, impeller meter and turbid flow meter

Unit IV [16 T]

Hall effect transducers, Digital transducers, Piezo-electric sensors, eddy current

transducers, tachometers and stroboscopes, Magnetostrictive transducers

Radiation sensors: LDR, Photovoltaic cells, photodiodes, photo emissive cell types

Force and Torque Transducers: Proving ring, hydraulic and pneumatic load cell, dynamometer and gyroscopes.

Sound Transducers: Sound level meter, Microphone.

Text Books

1. D Patranabis, Sensors and Transducers, PHI, 2nd Edition.
2. E. A. Doebelin, Measurement Systems: Application and Design McGraw Hill, New York
3. A.K. Sawhney, - A course in Electrical & Electronic Measurement and Instrumentation, Dhanpat Rai and Company Private Limited.
4. Murthy D.V.S., —Transducers and Instrumentation, 2nd Edition, Prentice Hall of India Private Limited, New Delhi, 2010.
5. S.Renganathan, —Transducer Engineering, Allied Publishers, 2005

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

B.C.A DEGREE EXAMINATION - SEMESTER 4

MODEL QUESTION PAPER

SJBCA3A12 - SENSORS AND TRANSDUCERS

TIME: 2 ½ HOURS

MAX: 80MARKS

SECTION A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2Marks. Ceiling 25 marks)

1. What do you mean eddy current transducers?
2. Explain u tube manometer.
3. Explain Bernoulli's principle.
4. Write note on Radiation sensors.
5. What do you mean by electromagnetic flow meter?
6. What is Microphone?
7. Define the terms LDR, RTD
8. Explain Pressure Transducers.
9. Write note on thermo emf sensors
10. Explain Characteristics of transducers.
11. What do you mean by RVDT?
12. Write basic requirement of transducers.
13. What is anemometers?
14. What is tacho generators?
15. What is photodiodes?

SECTION B – Short Essay type questions

**(Answer all questions, each correct answer carries a maximum of 5 marks.
Ceiling 35 marks)**

16. Explain Force and Torque Transducers.
17. Define the terms Transducers, Thermocouple, Rotameter.
18. Explain Orifice plate and nozzle plate.
19. Explain Radiation sensors.
20. Write about Capacitance Transducer.
21. Explain Digital transducers and Piezo-electric sensors.
22. Explain Sound Transducers.
23. Explain different types of manometers

SECTION C – Essay type questions

(Answer any two question, correct answer carries 10 marks)

24. Compare thermal sensors and thermo emf sensors.
25. Explain Flow Transducers.
26. Explain different types of transducers
27. Explain the working principle of RTD

Course Code: SJBCA3B04

Name of the Course: Data Structures using C

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Be able to design and analyze the time and space efficiency of the data structure .	PSO3,PSO4	Z	F	15

CO2	Be capable to identity the appropriate data structure for given problem	PSO3,PSO4	U	F	10
CO3	Have practical knowledge on the applications of data structures	PSO3,PSO4	C	P	15
CO4	Understand the concept of Dynamic memory management, data types, algorithms, Big O notation.	PSO3,PSO4	U	P	10
CO5	Understand basic data structures such as arrays, linked lists, stacks and queues.	PSO3,PSO4	U	P	15
CO6	Describe the hash function and concepts of collision and its resolution methods	PSO3,PSO4	U	F	10
CO7	Solve problem involving graphs, trees and heaps	PSO3,PSO4	A	P	15

CO8	Apply Algorithm for solving problems like sorting, searching, insertion and deletion of data	PSO3,PSO4	A	P	12
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SJBCA3B04 – Data Structures Using C

Course Number: 16

Contact Hours per Week: 7 (3T + 4L)

Number of Credits: 3

Number of Contact Hours: 112 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To introduce the concept of data structures
- To make the students aware of various data structures
- To equip the students implement fundamental data structures

Prerequisites

UNIT I

Arrays: Introduction, Linear arrays, Representation of linear array in memory, Traversal, Insertions, Deletion in an array, Multidimensional arrays, Parallel arrays, sparse matrix.

UNIT II

Linked List: Introduction, Array vs. linked list, Representation of linked lists in memory, Traversal, Insertion, Deletion, Searching in a linked list, Header linked list, Circular

linked list, Two-way linked list, Applications of linked lists, Algorithm of insertion/deletion in Singly Linked List (SLL).

UNIT III [10 T + 14 L]

Stack: primitive operation on stack, algorithms for push and pop. Representation of Stack as Linked List and array, Stacks applications: polish notation, recursion.

Introduction to queues: Primitive Operations on the Queues, Circular queue, Priority queue, Representation of Queues as Linked List and array, Applications of queue: Algorithm on insertion and deletion in simple queue and circular queue.

UNIT IV [10 T + 14 L]

Trees - Basic Terminology, representation, Binary Trees, Tree Representations using Array & Linked List, Basic operation on Binary tree: insertion, deletion and processing, Traversal of binary trees: In order, Pre-order & post-order, Algorithm of tree traversal with and without recursion, Binary Search Tree, Operation on Binary Search Tree, expression trees, implementation using pointers, applications.

UNIT V [10 T + 14 L]

Introduction to graphs, Definition, Terminology, Directed, Undirected & Weighted graph, Representation of graphs, graph traversal- depth-first and breadth-first traversal of graphs, applications.

Searching: sequential searching, binary searching, Hashing – linear hashing, hash functions, hash table searching; Sorting: Quick Sort, Exchange sort, Selection sort and Insertion sort.

Text books

1. Seymour Lipschutz, “Data Structures”, Tata McGraw- Hill Publishing Company Limited, Schaum’s Outlines, New Delhi.
2. YedidyanLangsam, Moshe J. Augenstein, and Aaron M. Tenenbaum, “Data Structures Using C”, Pearson Education., New Delhi.
3. Horowitz and Sahani, “Fundamentals of data Structures”, Galgotia Publication Pvt. Ltd., NewDelhi.

Reference books

1. Trembley, J.P. And Sorenson P.G., “An Introduction to Data Structures With Applications”, Mcgraw- Hill International Student Edition, New York.
2. Mark Allen Weiss, “Data Structures and Algorithm Analysis in C”, Addison-

Wesley, (An Imprint of Pearson Education), Mexico City.

3. A.K.Sharma, Data Structures Using C, Pearson, Second edition, 2011
4. Nair A.S., Makhalekshmi, Data Structures in C, PHI, Third edition 2011.
5. R. Kruse et al, "Data Structures and Program Design in C", Pearson Education Asia, Delhi- 2002
6. K Loudon, "Mastering Algorithms with C", Shroff Publisher & Distributors Pvt. Ltd.

MODEL QUESTION PAPER

THIRD SEMESTER BCA DEGREE EXAMINATION APRIL 2020

MODEL QUESTION PAPER

SJBCA3B04- DATA STRUCTURES USING C

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. What is Big-O notation?
2. What is an array?
3. What is sparse matrix?
4. Define stack.
5. What is a circular linked list?
6. What is hashing ?
7. Explain binary search.
8. Describe quick sort.
9. What is an algorithm?
10. Discuss the operations on stacks
11. What is a graph?
12. What is sequential search?

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Explain operations on array.
14. Discuss the operations on stacks.
15. Explain various queue structures.
16. Define a tree and its basic terminologies.
17. Explain representation of Graphs.
18. Write notes on algorithm complexity.
19. Write a note on string operations.

SECTION C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

20. Write an algorithm to implement insertion sort. Explain it with an example.
21. Explain the different graph traversal methods

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Understand the concepts of probability and statistical methods.	PSO3	U	F	10
CO2	Apply numerical methods to obtain approximate solutions to mathematical problems.	PSO3	A	F	10
CO3	Derive numerical methods for various mathematical operations and tasks, such as interpolation, differentiation, integration, the solution of linear and nonlinear equations, and the solution of differential equations.	PSO3	A	F	15

CO4	Analyse and evaluate the accuracy of common numerical methods.	PSO3	Z	F	10
CO5	Derive Best Curve fitting for given data.	PSO3	A	F	10
CO6	Understand Statistical Methods for Data Analysis and sampling techniques	PSO3	U	F	10
CO7	Solve Mathematical Equations by various methods.	PSO3	A	F	15

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SJBCA3C05- Computer Oriented Numerical & Statistical Methods

Course Number: 17 Contact

Hours per Week: 5 Number of

Credits: 3

Number of Contact Hours: 80 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To learn the floating point arithmetic
- Learning to solve linear equations.
- To learn numerical differentiation and integration.

- To learn the basics of statistics and probability theory

Prerequisites

Background of the basic Mathematics

Course Outline

UNIT I (8T)

Floating Point Arithmetic - Errors, Significant digits and Numerical Instability, Roots of Algebraic Equations - Bisection Method - Method of False Position - Newton Raphson Method.

UNIT II (12T)

Interpolation and Approximation–Lagrange & Newton; Interpolations- Finite Difference Operators, Interpolating; Polynomials using finite differences, Simpson's 1/3rd rule, Trapezoidal method.

UNIT III (20T)

Basics statistics: Measures of central tendencies - Mean, Median, Mode, Geometric mean and Harmonic mean. Measures of dispersion - Range, quartile deviation, Lorenz curve. Mean deviation and standard deviation.

UNIT IV (20T)

Curve fitting- Principles of least squares, fitting of straight lines. Correlation (Bivariate case only) Pearson's coefficient of correlation. Rank correlation and Regression analysis. Probability theory: Random experiment. Sample point, sample space, events, union, intersection and compliment of events.

UNIT V (20T)

Random variables and probability distribution, Discrete and continuous random variables- density function- distribution- density function.

Reference books

1. Numerical Methods in Engineering, Salvadori & Baron, PHI

2. Numerical Methods for Scientific and Engineering Computation, M.K. Jain, SRK, Iyengar, R.K. Jain, New Age International
3. Introduction to Mathematical Statistics, Hogg R V Craig A T, Macmillan
4. Mathematical Statistics, Freund J E, Waple R E, Prentice Hall of India.
5. Probability and Statistics for *Engineers*, Miller I Freund J E, Prentice Hall of India.

MODEL QUESTION PAPER

**BCA - SEMESTER 3
SJBCA3C05- COMPUTER ORIENTED NUMERICAL & STATISTICAL
METHODS**

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. Define principle least squares
2. Define an event and give examples
3. Define mathematical expectation of a random variable
4. What is Curve Fitting
5. Explain the principle of false position method
6. Find the approximate value of \int — using Trapezoidal rule
7. Explain mean, median and mode
8. Write newton-Raphson formula to obtain the cube root of
9. Define HM
10. What is Lorenz curve
11. Define sample space with example
12. Explain shift operator

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. State and prove addition theorem of probability
14. Define random variable and distribution function. What are the properties of it?
15. Two unbiased dice are thrown find the expected value of the sum of numbers turned up
16. Explain briefly the procedure followed in tests of statistical hypothesis
17. Evaluate $\int -x^2 dx$ by dividing the range into 4 equal parts using trapezoidal rule
18. Obtain the least square polynomial approximation of degree for () on
19. With suitable example explain Newton's divided difference interpolation method

SECTION C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

20. Explain briefly about trapezoidal rule and Simpson's rule
21. You are given the following data

A.M		
S.D		

Correlation coefficient between and is

-) Find the regression equations.
-) Estimate the value of when

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	To use basic concepts of formal languages of finite automata techniques	PSO2	U	F	15
CO2	To Design Finite Automata's for different Regular Expressions and Languages	PSO2	A	C	15
CO3	To solve various problems of applying normal form techniques, push down automata and Turing Machines	PSO2	A	C	15
CO4	To explain the hierarchy of problems arising in the computer sciences.	PSO2	U	F	15

CO5	solve computational problems regarding their computability and complexity and prove the basic results of the theory of computation.	PSO2	A	C	10
CO6	Identify limitations of some computational models and possible methods of proving them.	PSO2	A	C	10

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SJBCA3C06 –Theory of Computation

Course Number: 18

Contact Hours per Week: 5

Number of Credits: 3

Number of Contact Hours: 80 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To get a general introduction to the theory of Computer Science
- To get a general understanding on different languages, grammar and automata

Prerequisites

Basic knowledge in discrete structures and graph theory.

Course Outline

UNIT I (10T)

Introduction to Mathematical preliminaries: Sets, Functions and Relations, graphs and trees, Strings and their Properties, Proof techniques: By induction, by contradiction.

UNIT II (10T)

Formal languages: Definitions and examples, Chomsky classification of languages, Languages and their relation, Recursive and Recursively enumerable sets, Languages and automata.

UNIT III (20T)

Theory of Automata: Definition of automaton, description of a finite automaton, DFA, transition systems, properties of transition functions, acceptability of a string by a finite automaton, Non deterministic finite state machines: with epsilon moves and without epsilon moves, equivalence of DFA and NFA, Mealy and Moore Models, minimization of finite automata. Regular sets and grammar: Regular expressions, Finite automata and regular expressions, closure properties of regular sets, Algebraic laws for regular expressions, regular sets and regular grammars

UNIT IV (20T)

Context free languages: Context free languages and derivation trees, Ambiguity in context free grammars, Simplification of context free languages, normal forms for context free languages.

UNIT V (20T)

Pushdown automata: Definition, Acceptance by PDA, Pushdown automata and Context-free languages, Parsing and Pushdown Automata. Turing Machines: Turing machine model, representation of Turing machines, languages accepted by Turing machine.

Textbooks

1. Theory of Computer Science- Automata, Languages and Computation- K.L.P. Mishra, N Chandrasekaran, PHI
2. Theory of Computation, Sachin Agrawal, Vikas Publishing House

Reference books

1. Introduction to Automata Theory, Languages & Computations, J.E Hopcroft, R Motwani & J. D. Ullman
2. Elements of theory of Computation, Second edition, H.R. Lewis and C.H. Papadimitriou, Pearson education.
3. An Introduction to the Theory of Computer Science, Languages and Machines- Thomas A. Sudkamp, Third Edition, Pearson Education.
4. An Introduction to Formal languages and Automata- Peter Linz

MODEL QUESTION PAPER

**BCA - SEMESTER 3
SJBCA3C06- Theory of Computation**

**TIME: 2 HOURS
MARKS**

MAX: 60

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. Define NFA and DFA. Construct DFA for the language $L = \{w : |w| \bmod 3 = 0\}$ on $\{a, b\}$.
2. Explain Mealy and Moore Models.
3. What is meant by star-closure and positive-closure?.
4. Design a TM that accepts the language of odd integers written in binary.

5. Define graph and trees.
6. Explain Context free languages.
7. What is meant by left-linear and right-linear grammar?
8. Explain Ambiguity in context free grammars.
9. Explain acceptance by PDA.
10. Explain Strings and their Properties
11. Explain DFA with an Example
12. Explain equivalence of DFA and NFA

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Explain acceptance by PDA.
14. Explain representation of Turing machines.
15. Convert the grammar
 $S \rightarrow AB \mid aB$
 $A \rightarrow aab \mid \lambda$
 $B \rightarrow bbA$
Into Chomsky normal form.
16. Write a note on automata
17. . Show that the language L and its complement L' are both recursively enumerable if L is recursive.
18. Explain algebraic laws for regular expressions
19. Construct DFA for the language $L = \{w : |w| \bmod 3 = 0\}$ on $\{a, b\}$.

SECTION C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

20. . Explain Recursive and Recursively enumerable sets.
21. Explain minimization of finite automata.

FOURTH SEMESTER

Course Code: SJBCA4A13

Name of the Course: Data Communication and Optical Fibers

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Recognize and classify the structures of Optical fiber and types.	PSO2	U	F	8
CO2	Discuss the channel impairments like losses and dispersion.	PSO2	U	F	8
CO3	Analyze various coupling losses.	PSO2	A	F	8
CO4	Classify the Optical sources and detectors and to discuss their principle.	PSO2	U	F	8
CO5	Familiar with Design considerations of fiber optic systems.	PSO2	U	F	8

CO6	To perform characteristics of optical fiber, sources and detectors, design as well as conduct experiments in software and hardware, analyze the results to provide valid conclusions.	PSO2	Z	F	8
CO7	Distinguish Step Index, Graded index fibers and compute mode volume.	PSO2	U	F	8
CO8	Explain the Transmission Characteristics of fiber and Manufacturing techniques of fiber/cable.	PSO2	U	F	8

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***F-factual, C-conceptual, P-practical/procedural**

SJBCA4A13– Data Communication and Optical Fibers

Course Number: 15

**Contact Hours per
Week: 4T Number of
Credits: 4 Number of
Contact Hours: 64**

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Course Outline

Unit I [16T]:

Introduction- Components, Networks, Protocols and standards, Basic Concepts: Line Configuration, Topology Transmission mode, analog and digital signals, Encoding and modulating- analog-to-digital conversion, digital to analog conversion, digital data transmission, DTE-DCE interface, modems, cable modems. Transmission media: guided media, unguided media, and transmission impairment.

Unit II [16T]

Multiplexing: Many to one/ one to many, frequency division multiplexing, wave division multiplexing, TDM, multiplexing applications: the telephone system, Cellular System, Mobile Communication-GSM, Mobile Services, GSM system Architecture, Radio Interface in GSM

Unit III [16T]

Data link Control: Line Discipline, flow control, error control, Data link Protocols: Asynchronous Protocols, synchronous protocols, character oriented protocols, bit – oriented protocols, link access procedures. Local Area Networks: Ethernet, token bus, token ring, FDDI, Comparison, Switching- circuit switching, packet switching, message switching, integrated services digital networks (ISDN): services, history, subscriber access to ISDN.

Unit IV [16T]

Overview of Optical Fiber Communication - Introduction, historical development, general system, advantages, disadvantages, and applications of optical fiber communication, optical fiber waveguides, fiber materials, Optical Sources And Detectors- Introduction, LED's, LASER diodes, Photo detectors. Ray theory, cylindrical fiber, single mode fiber, cutoff wave length, mode field diameter.

Text Book:

1. Behrouz A. Forouzan, Data Communication and Networking, TMH
2. Mobile Communications – Jochen H. Schiller , Second Edition ,Pearson
3. Optical Fiber Communication – Gerd Keiser, 4th Ed., MGH, 2008.

Reference Books:

1. William Stallings: Data & Computer Communications, 6/e, Pearson Education.

2. William L. Schweber : Data Communication, McGraw Hill.
3. Electronic Communication Systems - Kennedy and Davis, TMH
4. Optical Fiber Communications – – John M. Senior, Pearson Education. 3rd Impression, 2007.
5. Fiber optic communication – Joseph C Palais: 4th Edition, Pearson Education.

MODEL QUESTION PAPER

SIXTH SEMESTER BCA DEGREE EXAMINATION

MODEL QUESTION PAPER

SJBCA4A13 – DATA COMMUNICATION AND OPTICAL FIBERS

TIME: 2 ½ HOURS

MAX: 80 MARKS

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 25 marks)

2. What are the features of data link layer?
3. Define ray theory.
4. Describe digital to analog conversion.
5. What are the different categories of networks?
6. What are the different classifications of CSMA?
7. Describe the term ISDN.
8. What is Internetwork?
9. Define token ring and token bus.
10. Describe modem.
11. What is switching?
12. What do you mean by cylindrical fibers?
13. What are the error control schemes in Data link layer?
14. What are LASER diodes?
15. What is Ethernet?
16. What are the applications of optical fiber communication?

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 35 marks)

17. Explain transmission modes.
18. Explain advantages and disadvantages of optical fiber communication.
19. Explain different topologies of computer network.
20. Explain optical sources and detectors.
21. Explain DTE-DCE interface.
22. Explain the system architecture of GSM.
23. Explain packet switching.
24. Explain Data link Protocols

SECTION C – Essay type questions

(Answer any two questions. Correct answer carries 10 marks)

25. Explain in detail sliding window protocol with the help of a neat diagram.
26. Briefly explain different types of transmission media.
27. Explain Optical Sources And Detectors
28. Explain multiplexing applications

Course Code: SJBCA4A14

Name of the Course: Microprocessors Architecture and Programming

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Understand the Microprocessor's and Microcontroller's internal architecture and its operation within the area of manufacturing and performance.	PSO2	U	F	8
CO2	Assess and solve basic binary math operations using the microprocessor.	PSO2	Z	F	8
CO3	Apply knowledge and demonstrate programming proficiency using the various addressing modes.	PSO2	A	F	8

CO4	Compare accepted standards and guidelines to select appropriate Microprocessor (8085 & 8086) and Microcontroller to meet specified performance requirements.	PSO2	Z	F	8
CO5	Analyse assembly language programs; select appropriate assemble into machine a cross assembler utility of a microprocessor and microcontroller.	PSO2	Z	F	8
CO6	Design electrical circuitry to the Microprocessor I/O ports in order to interface the processor to external devices.	PSO2	C	F	8
CO7	Evaluate assembly language programs and download the machine code that will provide solutions real- world control problems.	PSO2	E	F	8

CO8	Improve programming efficiency using data transfer instructions of the target microprocessor and microcontroller.	PSO2	C	F	8
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***F-factual, C-conceptual, P-practical/procedural**

SJBCA4A14 - Microprocessors Architecture and Programming

Course Number: 19

Contact Hours per

Week: 4T Number of

Credits: 4

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objective

- To understand internals of Microprocessor.
- To learn architecture of 8085 Microprocessor
- To learn instruction set of 8085 Microprocessor
- To learn how to program a Microprocessor

Prerequisites

- Basic knowledge of Computer.

Course Outline

Unit I [16 T]

General architecture of computer, Introduction to Microprocessor, Memory classification, Introduction to 8085, Microprocessor bus organizations, data bus, address bus, control bus. Memory addressing, memory mapping. 8085 architecture in detail. General purpose registers and special purpose registers, flag register -8085 pins and signals.

Unit II [16 T]

Assembly language programming basics. Opcode, Mnemonics etc. 8085 instruction set, Data transfer, Arithmetic and Logic, Shifting and rotating, Branching/Jump, Program control. Addressing modes. Memory read and write cycle. Timing diagram. Instruction cycle, machine cycle and T-states. Types of I/O addressing. Simple programs.

Unit III [16 T]

Types of programming techniques looping, indexing (pointers), delay generation. Stack in 8085, call and return Instructions. Data transfer between stack and microprocessor. Subroutine and delay programs. Interrupts in 8085. Interrupt driven programs. Interfacing - Programmable peripheral devices - 8255A, 8254, 8237.

Unit IV [16 T]

Introduction to 8086/88 microprocessors – overview, 8086 internal architecture. The execution unit, BIU, Registers, Flags, Segmentation, physical address calculation, addressing modes.

Text Books:

1. Ramesh S. Gaonkar, Microprocessor Architecture Programming and Application with 8085, Prentice Hall
2. Doughles V Hall, Microprocessors and Interfacing: Programming and Hardware, Tata McGraw Hill

Reference Books:

1. Microprocessor and Microcomputer - Based system Design - M. Rafiquzzman - CRC press
2. A.P Mathur, Introduction to Microprocessors, Tata McGraw-Hill Education
3. The Intel Microprocessors: 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, Pentium Pro, Pentium II, III, IV and Core 2 with 64 bit Extensions, Barry B. Brey, Prentice Hall Pearson
4. Microprocessors PC Hardware and Interfacing –N.Mathivanan – PHI

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

**BCA - SEMESTER 3
MODEL QUESTION PAPER**

SJBCA4A14 - Microprocessors Architecture and Programming

TIME: 2 ½ HOURS

MAX: 80

Marks

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 25 marks)

2. What are different data movement instructions in 8086?
3. Define functions of flag register.
4. What is meant by immediate address mode?
5. Explain subroutine
6. Write any 4 logical instructions
7. What are the different functional units in 8086?
8. Why 8086 had 1MB memory?
9. Write the applications of 8254 and 8255
10. What is DMA?
11. Give structure of MACRO definitions
12. Explain concept of modular programming.
13. Explain concept of pipelining.
14. Explain Mnemonics.
15. What is general purpose registers.
16. Explain instruction cycle.

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 35 marks)

17. Draw and explain the pin diagram of 8085.
18. Explain branch instructions in 8085.
19. Explain Target machine code generation control directives.
20. Write a note on programmable peripheral interface.
21. What is a flag? Explain flag register.
22. What are the different types of I/O addressing?

- 23. Explain call and return functions.
- 24. Explain 8237.

SECTION C – Essay type questions
(Answer any two questions. Correct answer carries 10 marks)

- 25. Explain characteristics of 80486 and Pentium in detail.
- 26. Explain internal Processor architecture of 8086.
- 27. Explain Interrupts and Interrupts routine in detail.

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)	Lab (Hrs)
CO1	Understand, appreciate and effectively explain the underlying concepts of database technologies	PSO3,PSO4	U	F	8	4
CO2	Design and implement a database schema for a given problem-domain	PSO3,PSO4	C	F	8	5
CO3	Normalize a database	PSO3,PSO4	C	P	8	10
CO4	Populate and query a database using SQL DML/DDL commands.	PSO3,PSO4	C	P	8	20

CO5	Programming PL/SQL including stored procedures, stored functions, cursors, packages.	PSO3,PSO4	C	P	8	15
CO6	Declare and enforce integrity constraints on a database using RDBMS	PSO3,PSO4	C	P	8	10

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA4B05 – Database Management System and RDBMS

Course Number: 21

Contact Hours per Week: 7 (3T + 4L)

Number of Credits: 3

Number of Contact Hours: 112 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To learn the basic principles of database and database design
- To learn the basics of RDBMS
- To learn the concepts of database manipulation SQL
- To study PL/SQL language

Prerequisites

- Basic knowledge of computers, data structures and programming

Course Outline

Unit I [8 T+ 2L]

Database System concepts and applications Introduction to databases, File Systems vs. DBMS, Advantages and Disadvantages of using DBMS Approach, Database administrators and user, Data Models, Schemas, and Instances, Types of Data Models, Three Schema Architecture and Data Independence, Database Languages and Interfaces.

Unit II [10 T+ 6L]

Entity-Relationship Model - Conceptual Data Models for Database Design Entity Relationship Models, Concept of Entity, Entity Sets, Relationship Sets, Attributes, Domains, Constraints, Keys, Strong and Weak Entities, Concepts of EER.

Relational Data Model Relations, Domains and Attributes, Tuples, Keys. Integrity Rules, Relational Algebra and Operations, Relational Calculus and Domain Calculus, Relational Database Design using ER to Relational Mapping.

Unit III [10 T+12L]

Relational Database Design - Relational database design Anomalies in a Database, Normalization Theory, Functional Dependencies, First, Second and Third Normal Forms, Relations with more

than one Candidate Key, Good and Bad Decompositions, Boyce Codd Normal Form, Multivalued Dependencies and Fourth Normal Form, Join Dependencies and Fifth Normal Form.

Unit IV [10 T +20L]

SQL Concepts: Basics of SQL, DDL, DML, DCL, Tables – Create, Modify and Delete table structures, Rename and Drop tables, Defining constraints – Primary key, foreign key, unique, not null, check, IN operator

Select Command, Logical Operators, Functions - aggregate functions, Built-in functions –numeric, date, string functions, set operations, sub-queries, correlated sub-queries, Use of group by, having, order by, join and its types, Exist, Any, All. View - Creation, Renaming the column of a view, destroys view.

Unit V [10 T+24L]

Transaction Management and Concurrency Control - Transaction Properties (ACID), states, Commit, Rollback; Concurrency Control Lost update problems, Locks, two phase

locking.

Programming with SQL: Data types: Base and Composite, Attributes. Variables – Constants - Using set and select commands, Control Structures: IF, IF THEN ELSE, IF THEN ELSEIF, CASE. Loops: LOOP, EXIT, CONTINUE, WHILE, FOR, and FOREACH - Looping Through Arrays - Looping Through Query Results. Security: Locks: Table-level Lock, Row-level Lock, Deadlock, Advisory Lock. Cursors: Bound and Unbound Cursors, Declaration, Opening, Working with cursors: FETCH, MOVE, UPDATE/DELETE, CLOSE, Looping through a Cursor. Concept of Stored Procedures – Advantages and Disadvantages – Creation – Parameters Setting for Function- Alter – Drop – Grant and Revoke - Passing and Returning data to/from Stored Procedures - Using stored procedures within queries – Triggers: Creation, Modification, Deletion, Error Handling: Control Structures, Cursors, Functions, Triggers.

Textbooks:

1. Abraham Silberschatz, Henry F Korth, S.Sudharshan, Database System Concepts, 6th Edition
2. W. Gilmore, Beginning PHP and PostgreSQL 8: From Novice to Professional, Goels Computer Hut (2007), ISBN:9788181286000
3. PostgreSQL Official Documentation Online

Reference books:

1. Alex Krigel and Boris M.Trukhnov, SQL Bible, Wiley pubs
2. Paul Nielsen, Microsoft SQL Server 2000 Bible, Wiley Dreamtech India Pubs.
3. CJ Date, Introduction to Database Systems, Addison Wesley.
4. Ramkrishnan, Database Management Systems, McGraw Hill

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

B.C.A DEGREE EXAMINATION - SEMESTER 4

MODEL QUESTION PAPER

SJBCA4B05- DATABASE MANAGEMENT SYSTEM AND RDBMS

TIME: 2 HOURS

MAX:60 MARKS

SECTION A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 Marks. Ceiling 20 marks)

24. What do you mean by serializability in transaction management?
25. Differentiate database schema and state.

26. Explain the basic properties of a transaction
27. What are the advantages of the DBMS?
28. What you mean by data independence?
29. What is normalization? Explain 1NF, 2NF, 3NF with an example.
30. With suitable examples, explain set operations in relational algebra.
31. Explain the loop statements available in PL/SQL
32. Explain database anomalies.
33. What is two-phase locking? How it guarantee serializability.
34. GRANT and REVOKE commands.
35. ALTER TABLE statement.

SECTION B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

36. What are array of objects? Explain with example with detail.
37. Define the term deadlock and starvation with suitable example
38. Explain SQL GRANT and REVOKE commands.
39. Explain the usage of ALTER TABLE statement?
40. What are triggers? Explain how triggers are created and used in PL/SQL
41. Discuss the various types of join operations in relational algebra. How are the outer join operations different from join operations.
42. What is a view in SQL. Discuss the problems related to view update and how views are implemented.

SECTION C – Essay type questions

(Answer any one question, correct answer carries 10 marks)

20. Draw the ER diagram for the Banking enterprise. Explain.
21. Explain the data models in DBMS in detail

Course Code: SJBCA4B06

Name of the Course: Programming Laboratory II: Data Structures and RDBMS

**SJBCA4B06- Programming Laboratory II: Lab Exam of 3rd and
4th Semester - Data Structures and RDBMS**

Course Number: 22

Number of Credits: 4

Course Evaluation: Internal – 20 Marks + External – 80 Marks

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)	Lab (Hrs)
CO1	Make the students equipped to solve mathematical or scientific problems using C	PSO4	A	P	0	0
CO2	Practice how to implement various data structures..	PSO4	C	P	0	0
CO3	Use opportunity to students to use data structures to solve real life problems.	PSO4	A	P	0	0

Objective

- To make the students equipped to solve mathematical or scientific problems using C
- To learn how to implement various data structures.
- To provide opportunity to students to use data structures to solve real life problems.

Prerequisites

- Knowledge in operating computer.
- Theoretical knowledge in Data structures.

- Knowledge in Database

Course Outline

PART A – DATA STRUCTURE

1. Sort a given list of strings
2. Reverse a string using pointers.
3. Implement Pattern matching algorithm.
4. Search an element in the 2-dimensional array
5. Append 2 arrays
6. Merge two sorted array into one sorted array.
7. Search an element in the array using iterative binarysearch.
8. Search an element in the array using recursive binarysearch.
9. Implement sparse matrix
10. Implement polynomial using arrays
11. Implement singly linked list of integers.
12. Delete a given element from a singly linked list
13. Sort a singly linked list.
14. Delete an element from a singly linked list
15. Implement a doubly linked list of integers
16. Implement a circular linked list.
17. Implement polynomial using linked list
18. Addition of 2 polynomials
19. Implement Stack using array
20. Implement Stack using linked list
21. Infix expression into its postfix expression
22. Implement Queue using array
23. Implement Queue using linked list
24. Implement a binary search tree of characters.
25. Traverse a binary search tree non recursively inpreorder
26. Traverse a binary search tree non recursively ininorder
27. Traverse a binary search tree non recursively inpostorder
28. Traverse a binary search tree recursively inpreorder
29. Traverse a binary search tree recursivelyininorder
30. Traverse a binary search tree recursivelypostorder.
31. Delete an element from a binary search tree.
32. Search an element in a binary search tree
33. Implement linear sort
34. Implement bubble sort

35. Implement exchange sort
36. Implement selection sort.
37. Implement insertion sort.
38. Implement quick sort.
39. Implement merge sort.
40. Implement heap sort

Part B: DBMS– Lab Questions

1. Create a table employee with fields (EmpID,EName, Salary, Department, Age). Insert some records. Write SQL queries using aggregate functions for
 - A. Display the total number of employees.
 - B. Display the age of the oldest employee of each department.
 - C. Display departments and the average salaries
 - D. Display the lowest salary in employee table
 - E. Display the highest salary in sales department;
2. A trading company wants to keep the data of their Order Processing Application using the following relations.

Customer_Master

Customer_Number	-	Primary Key
Customer_Name	-	Not NULL
Address	-	
Pincode	-	

Order_Master

Order_Number	-	Primary Key
Order_date	-	Not NULL
Customer_Number	-	Refers
Customer_master table Order_amount	-	Not NULL

Order_Detail

Line_Number	-	Primary Key
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Order_Number	-	Primary Key
Item_No	-	Not NULL, Refers ITEM table
Quantity	-	Not NULL

ITEM

Item_No	-	Primary Key
UnitPrice	-	Not NULL

SHIPMENT

Order_Number	-	Primary Key
Warehouse_No	-	Primary Key,
Refers Warehouse table Ship_Date	-	Not NULL
with Integrity Check		

WAREHOUSE

Warehouse_No	-	Primary Key
City	-	Not NULL

- A. Create the above tables by properly specifying the primary keys and foreign keys.
 - B. Enter at least five tuples for each relation.
 - C. Produce a listing: Cust_Name, No_of_orders, Avg_order_amount, where the middle column is the total number of orders by the customer and the last column is the average order amount for that customer.
 - D. List the Order_Number for orders that were shipped from **all** the warehouses that the company has in a specific city.
 - E. Demonstrate the deletion of an item from the ITEM table and demonstrate a method of handling the rows in the ORDER_ITEM table that contains this particular item.
3. In this session you need to create database for an Employee management system of an ABC organization. The details about different tables are given below. According to that you can proceed further and create tables using PostgreSQL/MySQL

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Create the following tables with the specified constraints:

Department:

Department Number - Primary
Key Department Name -Not
NULL unique
Manager ID - Refers to EmployeeID
of employee table. Manager
Date of Joining - Not NULL.

Employee:

First Name
-
Not NULL Middle
Initials
Last Name - Not NULL
Employee ID - Primary Key
Date of Birth
-
Not NULL Address
Gender - M or F
Salary -
Range of
5000 to 25000 Date of Joining
Department Number - Refers to Department Number of Department
table.

Department location:
Department Number - Refers to Department number of

department table. Department Location - Not NULL.

Department number & Department location are combined Primary Key

Project:

Project Name - Not NULL. Project Number -Primary Key. ProjectLocation

Department number - Refers to department number of Department table.

Works-on:

Employee ID - Not NULL refers to Employee ID of Employee table. Project Number - Not NULL refers to Project number of Project table. Hours - Not NULL.

Employee ID & Project Number are combined primary key.

Dependent:

Employee ID - Refer to employee table

Employee ID field Dependent Name -
Gender - M or F

Date of Birth - Not NULL

Relationship - Not NULL

Now enter a few sets of meaningful data and answer the following queries.

- A. List the department wise details of all the employees.
 - B. Find out all those departments that are located in more than one location.
 - C. Find the list of projects.
 - D. Find out the list of employees working on a project.
 - E. List the dependents of the employee whose employee id is 001
4. These sessions is similar to the previous one, but in this session, assume that you are developing a prototype database of the College library management system, for thatyou need to create the following tables:
- Book Records
 - Book details
 - Member details and
 - Book issue details

Book Records:

AccessionNumber

ISBN Number

Books:

ISBN Number

Author Publisher

Price

Members:

Member ID

Member Name

Maximum Number of books that can be issued Maximum

Number of days for which book can be issued

Book Issue:

Member ID

Accession Number

Issue Date

Return Date

You must create constraints, including referential integrity constraints, as appropriate. Please note accession number is unique for each book. A book, which has no return date, can be considered as issued book. Enter suitable data into the tables. Now answer the following:

- A. Insert data in all the three tables (use insert).
- B. Insert appropriate description associated with each table and the column (use comment).
- C. Display the structure of the tables.
- D. Display the comments that you have inserted.
- E. Using SELECT statement, write the queries for performing the following function:
 - a. Get the list of all books (No need to find number of copies).
 - b. Get the list of all members.
 - c. Get the Accession number of the books which are available in the library.
 - d. On return of a book by a member calculate the fine on that book.
 - e. List of books issued on 01-Jan-2005.
 - f. Get the list of all books having price greater than Rs. 500/-

- g. Get the list of members who did not have any book issued at any time.
 - h. Get the list of members who have not returned the book.
 - i. Display member ID and the list of books that have been issued to him/her from time to time.
 - j. Find the number of copies of each book (A book accession number would be different but ISBN number would be the same).
 - k. Find the number of copies available of a book of given ISBN number.
 - l. Get the member ID and name of the members to whom no more books can be issued, because they have already got as many books issued as the number for which they are entitled.
5. This session is based on Lab 2 where you have created a library management system. In this session you have different query specification.

You must create appropriate forms, reports, graphs, views and data filtering, use of multilevel report, etc. to answer these queries.

- A. Get the list of ISBN-Number, Book name, available copies of the books of which available copies are greater than zero.
 - B. Get the list of ISBN-Number, Book name, Total copies, available copies of the book of which available copies are greater than zero. List should be displayed in alphabetical order of book name.
 - C. Get the list of ISBN number, Book name, Author, total copies, cost (cost is price total copies). List should be displayed in descending order of cost.
 - D. Get the list of books issued to each member.
 - E. Write query to know the maximum and average price of the books.
 - F. Get the list of all existing members and the number of days for which a member is allowed to keep the book. Also find out the members who have got the maximum number of books issued.
 - G. Get the list of member codes of those members who have more than two books issued.
 - H. Find the details of the books presently issued to a member.
 - I. Create the history of issue of a book having a typical accession number.
 - J. To set the width of the book name to 35.
6. Create the following table and perform the necessary tasks defined below one by one. You must use the query tools/ SQL/ Reports/ Forms/ Graphs/Views/ using client/server wherever needed.
1. Create the following table named customer

Column name	Type	Size
Customer ID	Character	10
Name	Character	25
Area	Character	3
Phone	Numeric	7

Insert the appropriate data into table and do the following.

- Update Phone numbers of all customers to have a prefix as your city STD Code
 - Print the entire customer table
 - List the names of those customers who have e as second letter in their names.
 - Find out the Customer belonging to area „abc“
 - Delete record where area is NULL.
 - Display all records in increasing order of name.
 - Create a table temp from customer having customer-id, name, and area fields only
 - Display area and number of records within each area (use GROUP by clause)
 - Display all those records from customer table where name starts with a or area is „abc“.
 - Display all records of those where name starts with „a“ and phone exchange is 55.
7. Answer the following queries using Library system as created earlier. You must create a view to know member name and name of the book issued to them, use any inbuilt function and operators like IN, ANY, ALL, EXISTS.
- a. List the records of members who have not been issued any book using EXISTS operator.
 - b. List the members who have got issued at least one book (use IN / ANY operator).
 - c. List the books which have maximum Price using ALL operator.
 - d. Display Book Name, Member Name, and Issue date of Book. Create a view of this query of the currently issued books.
8. Create a table of Employee (emp_number, name, dept_number, salary) and Department (dept_ number, dept_name). Insert some records in the tables through appropriate forms having integrity checks. Add some records in employee table where department value is not present in department table.

Now answer the following query:

- a. Display all records from employee table where department is not found in department table.
- b. Display records from employee table in a report format with proper headings. This report must also contain those records where department number does not match with any value of department table.
- c. Display those employee records who have salary less than the salary of person whose emp_number= A100.
- d. Create another table: SalesData (RegionCode, City, SalespersonCode, SalesQty).
- e. Display records where salesperson has achieved sales more than average sales of all sales persons of all the regions.

9. Create the following tables:

Order party: (Order number, Order date, customer code)
Order: Order number, Item code, Quantity

The key to the second table is order-number + item-code
Create a form for data entry to both the tables.

10. Create a table shop with fields Item_ID, Item_Name, Price, and Quantity. Write a procedure 'sales' to update the quantity by accepting Item_ID and Quantity as argument. Write PostgreSQL block to invoke the procedure
11. Implement student information system
12. SQL scripts to display various reports like Result of an Examination, Salary Report, Sales Report, Sales reports grouped on Sales person or item, etc
13. Write simple PostgreSQL anonymous blocks for displaying whole numbers from 1 to 100, odd numbers from 1 to 100, even numbers from 1 to 100, positive whole numbers up to a given number, odd numbers from 1 to a given number, even numbers from 2 to a given number, Fibonacci numbers up to 100, Strange numbers up to 1000, factorials of the numbers from 1 to 10, etc.
14. Create a table product with the fields(Product_code primary key, Product_Name, Category, Quantity, Price). Insert some records Write the queries to perform the following.
 - a. Display the records in the descending order of Product_Name
 - b. Display Product_Code, Product_Name with price between 20 and 50
 - c. Display the Product_Name and price of categories bath soap, paste,

washing powder

- d. Display the product details whose Quantity less than 100 and greater than 500
- e. Display product names starts with 's'
- f. Display the products which not belongs to the category 'paste'
- g. Display the product names whose second letter is 'a' and belongs to the Category 'washing powder'

15. Create a STUDENT table with following fields:

Field Name	Type	Width
RegNo	Character	10
Name	Character	20
Paper1	Numeric	3
Paper2	Numeric	3
Paper3	Numeric	3
Paper4	Numeric	3
Paper5	Numeric	3
Total	Numeric	3
Result	Character	6
Grade	Character	1

Enter the RegNo, Name and Marks in 5 Papers of at least 10 students. Write a SQL program to process the records to update the table with values for the fields Total (Paper1+Paper2+Paper3+Paper4+Paper5), Result („Passed“ if total is greater than or equal to 50% of the total; „Failed“ otherwise), and Grade („A“ if mark obtained is greater than or equal to 90% of the total mark, „B“ if mark obtained is greater than or equal to 75% of the total mark, „C“ if mark obtained is greater than or equal to 60% of the total mark, „D“ if mark obtained is greater than or equal to 50% of the total mark, and „F“ if mark obtained is less than 50% of the total mark). Display a report in descending order of the total mark, showing the data entered into the table along with the total marks, result and grade.

16. An examination has been conducted to a class of 10 students and 4 scores of each student have been provided in the data along with their reg_no, name, total and avg_score. Assign null values to the fields total and average. Write Postgresql block to do the following

Find the total and average of each student. Update the table with the calculated values Assign a letter grade to each student based on the average Score as

avg_score between 90 and 100	-	A	avg_score 75 -89	-	B
avg_score 60- 74	-	C			
avg_score 50 -59	-	D			
avg_score below 50	-	Failed			

17. Prepare a salary report of the employees showing the details such as:

EmpNo, Name, Basic Pay, DA, Gross Salary, PF, Net Salary, Annual Salary and Tax For this purpose, create a table named SALARIES having the following structure.

Field Name	Type	Width
EmpNo	Character	10
Name	Character	20
Basic	Numeric	6

Enter the records of at least 10 employees. Use the following information for calculating the details for the report:

DA is fixed as the 40% of
the basic pay. PF is fixed as
10% of the basic pay.

Gross Salary is (Basic

Pay + DA). Net Salary
is (Gross Salary – PF)
Annual Salary is (12 *
Net Salary)

Tax is calculated using the following rules:

If annual salary is less than 100000, No Tax

If annual salary is greater than 100000 but less than or equal to 150000, then the tax is 10% of the excess over 100000.

If annual salary is greater than 150000 but less than or equal to 250000, then the tax is 20% of the excess over 150000.

If annual salary is greater than 250000, then the tax is 30% of the excess over 250000.

18. Generate a Hospital information system that can generate the following reports:

- Patients who belongs to in-patient category
- Patients who belongs to out-patient category

For this purpose, create a table named HOSPITAL having the following structure.

Field Name	Type	Width
PatientID	character	10
Name	character	20
Age	numeric	3
Doctor	character	20
PatientType	character	15
ConsultCharge	numeric	6
BloodTestCharge	numeric	6
XrayCharge	numeric	6
OtherCharges	numeric	6
TotalAmount	numeric	6

Enter the records of at least 10 patients. Write a SQL program to display the report in the ascending order of patient name.

19. Using the Hospital table created in Lab 16, generate a Hospital information

system that can generate the following reports:

- Patients undergone blood test.
 - Patients who have taken X-Rays
20. Design a Hotel Bill calculating system that generates hotel bills for the customers.
 21. Design an Electricity Bill Report generating system that generates electricity bills detailsof customers for a month.
 22. Generate a Library Information System that generates report of the books available in the library.
 23. Programs involving multiple tables.
 24. Create a table named Elec_Bill (Cust_No, Cust_Name, Units_Consumed, Bill_Amt). Set bill_amt as null. Write a PostgreSQL function to calculate the Bill_Amt by accepting Cust_No and Units_Consumed. Write a PostgreSQL block to update the calculated amount by invoking thefunction.
 25. Create two tables Book (BookID, BookName, Author, Publisher) and Book_Del (Date_of_Del, BookID, BookName)

Create and application to generate a trigger before deleting a record from book table. The trigger procedure should insert the deleted BookID and BookName along with current date to the table Book_Del.

Include any 20 Data structure Lab questions and 15 DBMS Lab questions in the record book.

Note: All lab works should be neatly recorded in a Laboratory Record Book in written form. However Program results can be pasted in the left hand side of the fare record. All students should have a rough record (observation note book) too, in which they write all the works to be carried out in the lab prior to his/her entering the lab. He/She may also note down the i/p and o/p that he gives for program verification in the observation note book (rough record).

SYLLABUS FOR CORE COURSES

Course Code: SJBCA4C07

Name of the Course: E-Commerce

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Understand the basic concepts and technologies used in the field of management information systems.	PSO2	U	F	20
CO2	Have the knowledge of the different types of management information systems;	PSO2	U	F	20

CO3	Understand the processes of developing and implementing information systems;	PSO2	U	F	20
CO4	Be aware of the ethical, social, and security issues of information systems;	PSO2	R	F	20

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA4C07- E-Commerce

Course Number: 23

Contact Hours per Week: 5

Number of Credits: 3

Number of Contact Hours: 80 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To get a general introduction of the Electronic Commerce framework.
- To get a general understanding on the various electronic payment system.
- To get a general understanding on the Internal information systems.
- To get a general understanding on the new age information.

Prerequisites

- Basic knowledge of Commerce.

Course Outline

UNIT I (15T)

History of E-commerce and Indian Business Context : E-Commerce, Emergence of the Internet, Emergence of the WWW, Advantages of E-Commerce, Transition to E-Commerce in India, The Internet and India, E-transition Challenges for Indian Corporates.

UNIT II (15T)

Business Models for E-commerce: Business Model, E-business Models Based on the Relationship of Transaction Parties - E-business Models Based on the Relationship of Transaction Types.

UNIT III (18T)

Enabling Technologies of the World Wide Web: World Wide Web, Internet Client-Server Applications, Networks and Internets, Software Agents, Internet Standards and Specifications, ISP.e-Marketing: Traditional Marketing, Identifying Web Presence Goals, Online Marketing, E- advertising, E-branding

UNIT IV (17T)

e-Security : Information system Security, Security on the Internet, E-business Risk Management Issues, Information Security Environment in India.

Legal and Ethical Issues: Cyber stalking, Privacy is at Risk in the Internet Age, Phishing, Application Fraud, Skimming, Copyright, Internet Gambling, Threats to Children.

UNIT V (15T)

e-P ayment Systems: Main Concerns in Internet Banking, Digital Payment Requirements, Digital Token-based e-payment Systems, Classification of New Payment Systems, Properties of Electronic Cash, Cheque Payment Systems on the Internet, Risk and e-Payment Systems, Designing e-payment Systems, Digital Signature.

Reference books

1. *E-Commerce - An Indian Perspective*, P.T.Joseph, S.J., PHI
2. *E-Commerce Strategy, Technologies and Applications*, David

Whiteley, Tata Mc- Graw-Hill

3. *Frontiers of Electronic Commerce*, Ravi Kalakota, Andrew B. Whinston, Pearson Education Asia
4. *E – Commerce*, Jeffery F. Rayport, Bernard J. Jaworski, TMCH
5. *E-Commerce - A Managerial Perspective*, P.T. Joseph, PHI

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

**B.C.A DEGREE EXAMINATION - SEMESTER 4
MODEL QUESTION PAPER
SJBCA4C07- E-COMMERCE**

TIME: 2 HOURS

MAX: 60 MARKS

SECTION A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. What is e-business?
2. What are the different models of internet advertising.
3. What is hacking?
4. Write a note on internet.
5. What is spamming?
6. What is dial up connection?
7. What is online marketing?
8. What is biometric system?
9. What is Usenet?
10. What is C2C e-commerce? Give an example.
11. What are client server network? Give example.
12. Explain in detail mobile commerce.

SECTION B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. What are the advantages of Bricks 7 Clicks business?
14. Explain various types of e-business models.
15. What is EDI? Explain the features of EDI
16. What are various types of B2B models?
17. What are the advantages of e-commerce?
18. Explain the threats of internet security.
19. Explain B2C model.

SECTION C – Essay type questions

(Answer any one question, correct answer carries 10 marks)

20. Explain most electronic payment systems.
21. Explain different Generations in Wireless Communication.
22. Discuss the objectives and limitations of managing risks in e-commerce.

Course Code: SJBCA4C08

Name of the Course: Computer Graphics

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Understand the basics of computer graphics and applications of computer graphics.	PSO2	U	F	10
CO2	Have the knowledge of the different display devices and output primitives.	PSO2	U	F	10

CO3	Discuss various algorithms for scan conversion and filling of basic objects and their comparative analysis	PSO2	Z	F	10
CO4	Use of geometric transformations on graphics objects and their application in composite form.	PSO2	C	F	10
CO5	Extract scene with different clipping methods and its transformation to graphics display device.	PSO2	C	F	10
CO6	Explore projections and visible surface detection techniques for display of 3D scene on 2D screen.	PSO2	C	F	10

CO7	Render projected objects to naturalize the scene in 2D view and use of illumination models for this.	PSO2	C	F	10
CO8	Understand the basics of different colour models like RGB, CMY, YIQ, GIMP, etc.	PSO2	U	F	10

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA4C08- Computer Graphics

Course Number: 24 Contact Hours per

Week: 5 Number of Credits: 3

Number of Contact Hours: 80 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To learn the basics of Computer Graphics.

Prerequisites

- Basic knowledge in Mathematics and Computer fundamentals

Course Outline

UNIT I (10T)

Introduction to computer graphics definition, Application, Pixel, Frame Buffer, Raster and Random Scan Display, Display Devices CRT, Color CRT Monitors, basics of LCD and LED Monitors

UNIT II (12T)

Scan Conversion of Line, DDA Algorithm of Line Drawing, Scan Conversion of Circles- Bresenham's Circle Generating algorithm, Polygon Filling, Scan Line Polygon Filling Algorithm

UNIT III (20T)

Two-Dimensional Transformation, Translation, Rotation, Scaling, Homogeneous Coordinates, Reflection, Shear

UNIT IV (17T)

Window to Viewport Transformation, Clipping, Line Clipping, Cohen Sutherland Line Clipping, Polygon Clipping, Sutherland and Gray Hodgman Polygon Clipping Algorithm.

UNIT V (18T)

Color Models and Color Applications Light and Color, Different color models, RGB, CMY, YIQ. Introduction to GIMP, Image Manipulation Using GIMP.

Reference books

1. Donald Hearn and M Pauline Baker, Computer Graphics, PHI, New Delhi.
2. Zhigang Xiang and Roy Plasock, Computer Graphics, Schaum's Outlines.
3. Deborah Morley, Understanding Computer Today And Tomorrow, Introductory Edition.

MODEL QUESTION PAPER

ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

B.C.A DEGREE EXAMINATION - SEMESTER 4

MODEL QUESTION PAPER

SJBCA4C08- COMPUTER GRAPHICS

TIME: 2 HOURS

MAX: 60 Marks

SECTION A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. Define computer graphics.

2. What is frame buffer?
3. What do you mean by flat panel displays?
4. Define window and viewport.
5. Define primary colors and complementary colors.
6. What do you mean by clipping? Explain point clipping.
7. Mention the applications of computer graphics.
8. Define Shearing.
9. Write a note on plasma panel displays.
10. Explain LED.
11. What do you mean by polygon clipping?
12. Define beam penetration method.

SECTION B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Distinguish between raster and random scan display.
14. Explain Image Manipulation Using GIMP.
15. Explain Cohen Sutherland Line clipping algorithm.
16. Explain scan line polygon filling algorithm.
17. Explain translation and reflection.
18. Explain CRT display devices.
19. Write a note on RGB color model.

SECTION C – Essay type questions

(Answer any one question, correct answer carries 10 marks)

20. Explain Bresenham's Circle Generating algorithm with an example.
21. Explain Sutherland Hodgeman polygon clipping algorithm with an example.

SEMESTER 5

Course Code: SJBCA5B07

Name of the Course: Computer Organization and Architecture

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions(appr.)
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CO1	To identify the different functional unit of a computer and how a software is being executed in a computer	PSO2	U	C	10
CO2	To study the internal architecture and functions of 8085 and 8086 microprocessors	PSO2	U	C	11
CO3	To present an overview of the Computer Organization	PSO2	Z	C	12
CO4	To acquire the conceptual framework of Computer Organization and Architecture and to use the concepts in the domain of Personal Computers	PSO2	Z	F	10
CO5	Explain and apply the basic concepts of number systems and the use of Binary, Decimal and Hexadecimal number systems, and demonstrate competence in the conversion of numbers from one representation to another.	PSO2	U	F	8
CO6	Define the basic logic gates, such as AND, OR NOT in terms of Truth Tables and utilize Truth Tables to prove the functionality of simple gate networks	PSO2	U	F	6
CO7	Explain the universality of NAND and NOR gates.	PSO2	Z	C	4
CO8	Demonstrate familiarity with Boolean Operations, the Laws of Boolean Algebra, DeMorgan's Theorems and the application of Boolean Algebra and Karnaugh Maps to simplify logic circuits.	PSO2	A	C	3

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

(Syllabus)

SJBCA5B07 - Computer Organization and Architecture

Course Number: 25

Contact Hours per Week: 4 T

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives of the Course

- To learn logic gates, combinational circuits and sequential circuits
- To learn basics of computer organization and architecture

Prerequisites

- Boolean algebra

Course Outline

Unit I [12 T]

Digital Logic - Positive and negative logic, logic gates ,NOT gate, OR gate, AND gate, XOR and X-NOR gates, Universal gates- NAND gate, NOR gate,. Combinational circuits- Half adder, half subtractor, full adder, full subtractor, ripple carry adders, look-ahead carry adders, decoders, BCD to 7-segment decoder, encoders, multiplexers and demultiplexers.

Unit II [13 T]

Sequential Logic Circuits: Edge triggering, Pulse triggering ,SR latch, SR flip flop, JK flip flop, Master Slave JK flip flop, D flip flop, T flip flop. Shift register: serial in - serial out, serial in - parallel out, parallel

in - serial out, parallel in-parallel out configurations. counters (asynchronous & synchronous), up/down counter, decade counter, mod N counter, Ring counter, Johnson's counter

Unit III [13 T]

Basic Computer Organization and Design: Instruction Codes , Computer Registers, Computer Instructions, Instruction types, Timing and Control, Instruction Cycle, Memory reference Instructions, Register reference instructions, Input, Output and Interrupt Design of Basic Computer,

Design of Accumulator logic

Unit IV [13 T]

Micro programmed Control: Control Memory, Address sequencing, Micro program Example, Design of control unit. Processor Organization: general register organization, stack organization, instruction formats, addressing modes, data transfer and manipulation, program control

Unit V [13 T]

Memory Organization: Memory mapping, Associative memory, Cache memory, Virtual Memory, Memory Management Hardware, hit/miss ratio, Input-Output Organization: Peripheral devices, I/O interface, Modes of Transfer-asynchronous and synchronous, Priority Interrupt, Strobe Control, Handshaking. Direct Memory Access, Input-Output Processor, Serial Communication. I/O Controllers

Textbooks:

1. Thomas L Floyd, Digital Fundamentals, Universal Book Stall (Unit I and II)
- M. Morris Mano, *Computer System Architecture* PHI (Unit III – V)

References:

1. Rajaraman V & Radhakrishnan, An Introduction to Digital Computer Design, PHI.
2. William Stallings, *Computer Organization and Architecture*, PHI.
3. Malvino & Leach, Digital Principles & Applications, TMH
4. Jain R.P. , Modern Digital Electronics, TMH
5. Malvino, Digital Computer Electronics, TMH
6. Bartee T.C., Digital Computer Fundamentals, THM
7. William H. Gothmann, Digital Electronics: n Introduction to Theory and Practice, PHI

MODEL QUESTION PAPER

**ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA
B.C.A DEGREE EXAMINATION - SEMESTER 5
MODEL QUESTION PAPER
SJBCA5B07 - COMPUTER ORGANIZATION AND**

ARCHITECTURE TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 Marks. Ceiling 20 marks)

1. What do you mean by stacks?
2. Write short note on Instruction Format.
3. What is EEPROM?
4. Define Interrupt cycle.
5. Write short note on MIMD.
6. Explain the addressing modes with example.
7. Explain Booth multiplication algorithm.
8. Explain how ROM can be classified.
9. List out the basic computer registers.
10. List out the various memory mapping techniques.
11. What is the need of dynamic pipeline?
12. What are the functional units of computer?

Section B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Discuss direct and set associative mapping techniques.
14. Explain daisy chaining priority interrupt.
15. Explain the use of array processor.
16. Explain data hazard.
17. Briefly explain the memory organization.
18. Explain floating point arithmetic operation.
19. Explain data transfer and manipulation instructions.

Section C – Essay type questions

(Answer any one question, correct answer carries 10 marks)

20. Explain about DMA structure.
21. Explain the condition and solutions for cache coherence problem.

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)	Lab (Hrs)
CO1	Implement Object Oriented programming concept using basic syntaxes of control Structures, strings and function for developing skills of logic building activity.	PSO3	R	C	6	6
CO2	Identify classes, objects, members of a class and the relationships among them needed for a finding the solution to specific problem	PSO3	U	F	6	6
CO3	Demonstrates how to achieve reusability using inheritance, interfaces and packages and describes faster application development can be achieved.	PSO4	A	F	5	5
CO4	Demonstrate understanding and use of different exception handling mechanisms and concept of multithreading for robust faster and efficient application development	PSO4	U	C	6	6
CO5	Identify and describe common abstract user interface components to design GUI in Java using Applet & AWT along with response to events	PSO3	U	C	8	8
CO6	Identify, Design & develop complex Graphical user interfaces using principal Java Swing classes .	PSO4	U	F	8	8
CO7	Understand and apply object oriented principles.	PSO4	U	C	9	9

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***F-factual, C-conceptual, P-practical/procedural**

SJBCA5B08

JavaProgramming Contact Hours per Week: 6 (3T + 3L)

Number of Credits: 3

Number of Contact Hours: 96 Hrs.

Course Evaluation: Internal: 15 Marks + External: 60 Marks

Objectives

- To review on concept of OOP.
- To learn Java Programming Environments.
- To practice programming in Java.
- To learn GUI Application development in JAVA.

Prerequisites

- Knowledge in OOP & Programming

Course Outline

Unit I [9 T + 5L]

Introduction to OOPS, Characteristics of OOPS, Object oriented languages, comparison between procedural and object oriented programming, basic principles of Object Orientation-class, object,

Unit II [9 T + 8L]

Introduction to Java: History, Versioning, The Java Virtual Machine, Byte code, Writing simple java program, Language Components: Primitive Data Types, Comments, Keywords, literals, The break Statement, The continue Statement, Operators – Casts and Conversions, Arrays. Introduction to classes and methods, constructors, Passing Objects to Methods, Method Overloading, Static and final, The this Reference, finalize, inner and nested classes. Inheriting class, extends, member access and inheritance, super keyword, Object class. Dynamic method dispatch, method overriding, abstract class, interface, packages, import statement.

Unit III [10 T + 12 L]

Exceptions, I/O and Threads Input and Output in Java: The File Class, Standard Streams, Keyboard Input, File I/O Using Byte Streams, Character Streams, File I/O Using Character Streams - Buffered Streams, File I/O Using a Buffered Stream, Keyboard Input Using a Buffered Stream,

Writing Text Files. Threads: Threads vs. Processes, Creating Threads by Extending Thread, Creating Threads by Implementing Runnable, Advantages of Using Threads, Daemon Threads, Thread States, Thread Problems, Synchronization. Exceptions: Exception Handling, The Exception Hierarchy, throws statement, throw statement, Developing user defined Exception Classes- The finally Block.

Unit IV [10 T + 12 L]

Database Connectivity & Applets: Introduction to JDBC : The JDBC Connectivity Model, Database Programming, Connecting to the Database, Creating a SQL Query, Executing SQL Queries, Getting the Results, Updating Database Data, Executing SQL Update/Delete, The Statement Interface, The ResultSet Interface, ResultSetMetaData. Introduction to GUI Applications

- Applets - Types of Applet, Applet Skeleton, Update method, repaint Methods, Html Applet tag and passing parameter to applet.

Unit V [10 T + 11 L]

Events and GUI Applications: Event Handling: The Delegation Event Model, Event Classes, Event Listener Interfaces, Adapter Classes. Java Desktop Applications, Introduction to the AWT, Overview of the AWT, Structure of the AWT, The AWT hierarchy, Containers, Components, Canvas, Frame Working with: Color, Font, FontMetrics, Simple Graphics- Point, line, Rectangle, Polygon, Controls - Button, , Checkbox, Choice, , Label, List, Scroll bar, TextArea, TextField, Layout Manager, MenuBar, Menu, MenuItem , Checkbox MenuItem.

References

1. E Balaguruswamy, Programming in Java: A Primer, 4th Edition, Tata McGraw Hill Education Private Limited, ISBN: 007014169X.
2. Kathy Sierra, Head First Java, 2nd Edition, Shroff Publishers and Distributors Pvt Ltd, ISBN: 8173666024.
3. David Flanagan, Jim Farley, William Crawford and Kris Magnusson, Java Enterprise in a Nutshell: A Desktop Quick Reference, 3rd Edition, O'Reilly Media, ISBN: 0596101422.

MODEL QUESTION PAPER

ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

B.C.A DEGREE EXAMINATION - SEMESTER 5

MODEL QUESTION PAPER

SJBCA5B08- JAVA PROGRAMMING

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 Marks. Ceiling 20 marks)

1. What is the importance of java API.
2. What is a bytecode?
3. What do you mean by package in java.
4. What do you mean by constructor?
5. List any *four* methods in java.io.File class.
6. Differentiate List and Set interfaces in java.util package.
7. What is an interface? How interface helps to implement multiple inheritance in Java.
8. What is synchronization and how it is implemented in java?
9. Write a java program to check whether the given no is prime or not.
10. Differentiate java application and applet?
11. What do you mean by command line argument?
12. How the parameters are passed to an applet?

Section B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Write the importance of try, catch block in exception handling.
14. Write a java program to add two matrices.
15. Explain various looping structures in java.
16. Write any four methods in Object class with syntax.
17. Write short note on Text Field and Text Area classes in java.awt package.
18. Explain various operators in java.
19. Write a note on Stream objects.

Section C – Essay type questions

(Answer any one question, correct answer carries 10 marks)

20. What is polymorphism? Explain different forms of polymorphism with example.
21. What is a thread? Explain different states and methods of thread.

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)	Lab (Hrs)
CO1	Understand the PHP structure	PSO3	R	C	8	8
CO2	Identify Tags specifications	PSO3	U	F	6	6
CO3	Understand Data Management	PSO4	A	F	6	6
CO4	Write and make available to the public well formulated HTML pages with appropriate styling through CSS	PSO4	U	C	9	9
CO5	Identify when it is appropriate to use server side programming such as PHP and to write simple PHP code to perform some functionality for a web application	PSO3	U	C	10	10
CO6	Identify when it is appropriate to use client side programming such as Javascript and to write simple Javascript code to make a web application interactive	PSO4	U	F	9	9

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create , *F-factual, C-conceptual, P-practical/procedural**

SJBCA5B09 -Web Programming using PHP

Course Number: 27

Contact Hours per Week: 6 (3T + 3L)

Number of Credits: 3

Number of Contact Hours: 96 Hrs.

Course Evaluation: Internal: 15 Marks + External: 60 Marks

Remarks:- HTML portion covered in Computer Fundamentals and HTML paper is trimmed. Emphasis is given for HTML 5.

Objectives

- To review on concept of OOP.
- To learn Java Programming Environments.
- To practice programming in Java.
- To learn GUI Application development in JAVA.

Prerequisites

- Knowledge in OOP & Programming

Course Outline

Unit I [9 T + 9L]

Introduction web-documents: Static, Dynamic, Active - Web programming: client side and server side scripting. HTML 5: Document Structure, Elements, Attributes, Types of Elements and Attributes, Basic HTML Data types. Using HTML5 form elements: datalist, keygen, output, progress, meter. File uploading using forms - Frameset and frames. CSS: External CSS, CSS3 Syntax, Selector: Universal, Class, ID. Working with Lists and Tables, CSS ID and Class – Navigation Bar - Image Gallery – Image Opacity.

Unit II [9 T + 9L]

Javascript: Introduction, Client side programming, script tag, comments, variables. Including JavaScript in HTML: head, body, external. Data types. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements, Loops, break and continue. Output functions: write, writeln, popup boxes: prompt, alert, confirm. Functions: Built-in Global Functions: alert(), prompt(), confirm(), isNaN(), Number(), parseInt(). User Defined Functions, Calling Functions with Timer, Events Familiarization: onLoad, onClick, onBlur, onSubmit, onChange, Document Object Model (Concept). Objects: String, Array, Date.

Unit III [10 T + 10 L]

PHP: Introduction, Server side programming, Role of Web Server software, Including PHP Script in HTML: head, body, external. Comments, Data types, variables and scope, echo and print. Operators: Arithmetic, Assignment, Relational, Logical. Conditional Statements, Loops, break and continue. User Defined Functions.

Unit IV [10 T + 10 L]

Working with PHP: Passing information between pages, HTTP GET and POST method, Cookie, Session. String functions: strlen, strpos, strstr, strcmp, substr, str_replace, string case, Array constructs: array(),list() and foreach(). Header().

Unit V [10 T + 10 L]

PHP & PostgreSQL: Features of PostgreSQL, data types, PostgreSQL commands – CREATE DATABASE, CREATE TABLE, DESCRIBE TABLE (\d table_name or using information_schema), SELECT, SELECT INTO, CREATE AS, DELETE, UPDATE, INSERT. PHP - PostgreSQL Integration: Establishing Database Connection (pg_connect(), pg_connection_status(), pg_dbname()), Getting Error String (pg_last_error()), Closing database Connection (pg_close()), Executing SQL statements (pg_query(), pg_execute()), Retrieving Data (pg_fetch_row(), pg_fetch_array(), pg_fetch_all(), pg_fetch_assoc(), pg_fetch_object(), pg_num_rows(), pg_num_fields() pg_affected_rows(), pg_num_rows(), pg_free_result()), Insertion and Deletion of data using PHP, Displaying data from PostgreSQL database in webpage. Introduction to AJAX - Implementation of AJAX in PHP - Simple example for partial page update.

Textbook

1. HTML 5 Blackbook, Dreamtech Press, ISBN 9879351199076, 2016 Edition.
2. W. Gilmore, *Beginning PHP and PostgreSQL 8: From Novice to Professional*, Goels Computer Hut (2007), ISBN: 9788181286000

Reference

1. HTML 5 Blackbook, Dreamtech Press, ISBN 987-93-5119-907-6, 2016 Edition.
2. Jon Duckett, *Beginning Web Programming with HTML, XHTML, CSS*, Wrox.
3. Jim Converse & Joyce Park, *PHP & MySQL Bible*, Wiley.
4. PostgreSQL Official Documentation Online

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

B.C.A DEGREE EXAMINATION - SEMESTER 5

MODEL QUESTION PAPER

SJBCA5B09 – WEB PROGRAMMING USING PHP

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 Marks. Ceiling 20 marks)

1. Explain basic tags in HTML.
2. What is USE command?
3. Write a javascript code snippet to validate email address.
4. Explain the different types of links in a HTML page.
5. What is the id attribute used? What is its significance?
6. What is CSS? Give an example of using CSS font.
7. Briefly explain break and continue statement.
8. How are cookies implemented in PHP?
9. What is an associative array?
10. What do you mean by session and cookies?
11. What are the different super global variables?
12. List out the object oriented programming features of PHP scripting language.

Section B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Discuss table in HTML.
14. Explain how frames can be used to create a 2 column layout.
15. What are events? Explain events used in javascript.
16. Explain the different sorting functions defined in PHP.
17. What is the purpose of define() construct.
18. Write a PHP program to create multiplication table.
19. Describe the HTTP GET and POST methods.

Section C – Essay type questions
(Answer any one question, correct answer carries 10 marks)

20. Explain various control flow statements in javascript with suitable examples.
21. Illustrate the use of onclick and onload events in javascript with suitable examples

Course Code: SJBCA5B10

Name of the Course :Principles of Software Engineering

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions(appr.)
CO1	Define various software application domains and remember different process model used in software development.	PSO1	U	C	13
CO2	Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.	PSO1	U	C	13
CO3	Convert the requirements model into the design model and demonstrate use of software and user interface design principles.	PSO1	Z	C	14
CO4	Distinguish among SCM and SQA and can classify different testing strategies and tactics and compare them.	PSO1	Z	F	11

CO5	Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering in PLC.	PSO1	U	F	13
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***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA5B10 -Principles of Software Engineering

Course Number: 28

Contact Hours per Week: 4T

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal: 15 Marks + External: 60 Marks

Objectives

- To learn engineering practices in Software development.
- To learn various software development methodologies and practices.
- To learn and study various Evaluation methods in Software Development.

Prerequisites

- Knowledge in Programming

Course Outline

UNIT I [13T]

Software and Software Engineering: Overview of Software Engineering, Practice & Myths; Software Process; Generic process model- Framework Activity, Task Set, Process Patterns, Process Improvement; SDLC , Prescriptive process model- Waterfall Model, Spiral Model, Incremental Process Model, Evolutionary Process Model; Specialized Process Models: Component Based Development, the Formal Methods Models; Agile development-Agile Process; Extreme Programming; Other Agile Process Models – ASD, Scrum, DSDM, FDD, LSD, Agile Modeling, Agile Unified Process..

UNIT II [13T]

Requirements Engineering- Establishing the Groundwork- Eliciting Requirements - Developing use cases - Building the requirements model - Negotiating, validating Requirements - Requirements Analysis-Requirements Modeling Strategies.

UNIT III [14T]

MODELING WITH UML: Concepts and Diagrams - Use Case Diagrams - Class Diagrams - Interaction Diagrams - State chart Diagrams – Activity Diagrams - Package Diagrams - Component Diagrams - Deployment Diagrams -Diagram Organization- Diagram Extensions. Design Process- Design concepts: Abstraction, Architecture, patterns, Separation of Concerns, Modularity,

Information Hiding, Functional Independence, Refinement, Aspects, Refactoring, Object Oriented Design Concepts, Design Classes- Design Model: Data, Architectural, Interface, Component, Deployment Level Design Elements.

UNIT IV [11T]

Structured coding Techniques-Coding Styles - Standards and Guidelines-Documentation Guidelines-Modern Programming Language Features: Type checking-User defined data types-Data Abstraction Exception Handling - Concurrency Mechanism.

UNIT V [13T]

TESTING: Software Quality- Software Quality Dilemma- Achieving Software Quality- Testing: Strategic Approach to software Testing- Strategic Issues - Testing: Strategies for Conventional Software, Object oriented software, Web Apps-Validating Testing- System Testing- Art of Debugging. MAINTENANCE: Software Maintenance-Software Supportability- Reengineering - Business Process Reengineering- Software Reengineering- Reverse Engineering - Restructuring- Forward Engineering- Economics of Reengineering

Textbooks

1. Roger S, “*Software Engineering – A Practitioner’s Approach*”, seventh edition, Pressman, 2010.

2. Pearson Education, “*Software Engineering by Ian Sommerville*”, 9th edition, 2010. Roff:
UML: A Beginner’s Guide TMH

Reference books

1. Hans Van Vliet, “Software Engineering: Principles and Practices”, 2008.
2. Richard Fairley, “Software Engineering Concepts”, 2008.
3. RohitKhurana, Software Engineering: Principles and Practices, 2nd Edition, Vikas Publishing House Pvt Ltd.
4. PankajJalote, An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House.
5. Alhir, learning UML, SPD/O“Reily

MODEL QUESTION PAPER

B.C.A DEGREE EXAMINATION - SEMESTER 5
MODEL QUESTION PAPER
SJBCA5B10 – PRINCIPLES OF SOFTWARE ENGINEERING

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions, each correct answer carries a maximum of 2 Marks. Ceiling 20 marks)

1. Explain computer system engineering.
2. Explain spiral model.
3. Explain cohesion and coupling.
4. Explain white –box testing.
5. Explain SEI capability maturity model.
6. Explain emergence of software engineering.
7. Explain COCOMO techniques.
8. Explain characteristics of a user interface.
9. What are the characteristics of software maintenance?
10. What do you mean by software reuse?
11. Define DFD.
12. What do you mean by software reliability?

Section B – Short Essay type questions

(Answer all questions, each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Explain UNIT testing.
14. Explain generalized OOAD process.
15. Explain classical waterfall model.
16. Explain the types of user interfaces.

17. Explain UML diagrams.
18. Explain different program analysis tools.
19. What are the characteristics of a good software design?

Section C – Essay type questions
(Answer any one question, correct answer carries 10 marks)

20. Explain SDLC life cycle.
21. Explain CASE environment.

SEMESTER 6

Course Code: SJBCA6B11

Name of the Course: - Android Programming

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)	Lab (Hrs)
CO1	Describe Android platform, Architecture and features	PSO4	U	P	8	2
CO2	Design User Interface and develop activity for Android App.	PSO4	C	P	8	2
CO3	Use Intent, Broadcast receivers and Internet services in Android App.	PSO4	A	P	8	2

CO4	Design and implement Database Application and Content providers.	PSO4	C	P	8	2
CO5	Use multimedia, camera and Location based services in Android App.	PSO4	A	P	7	3
CO6	Discuss various security issues in Android platform	PSO4	U	P	7	3
CO7	Demonstrate their ability to deploy software to mobile devices	PSO4	E	P	7	3
CO8	Demonstrate their ability to debug programs running on mobile devices	PSO4	E	P	7	3

*R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

*F-factual, C-conceptual, P-practical/procedural

SJBCA6B11- Android

Programming Contact Hours per Week: 5(4T + 1L)

Number of Credits: 3

Number of Contact Hours: 80 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To have a review on concept of Android programming.
- To learn Android Programming Environments.
- To practice programming in Android.
- To learn GUI Application development in Android platform with XML

Prerequisites

- Knowledge in OO & Java Programming.

Course Outline

Unit I [13T+3L]

Introducing the android computing platform, History of android, android software stack, Developing end user application using Android SDK, Android java packages, Setting up the development environment, Installing android development tools (ADT), Fundamental components, Android virtual devices, Running on real device, Structure of android application, Application life cycle.

Unit II [13T+3L]

Understanding android resources - String resources, Layout resources, Resource reference syntax, Defining own resource IDs - Enumerating key android resources, string arrays, plurals, Colour resources, dimension resources, image resources, Understanding content providers - Android built in providers, exploring databases on emulator, architecture of content providers, structure of android content URIs, reading data using URIs, using android cursor, working with where clause, inserting updates and deletes, implementing content, Understanding intents basics of intents, available intents, exploring intent composition, Rules for Resolving Intents to Their Components, ACTION PICK, GET CONTENT, pending intents

Unit III [13T+3L]

User interfaces development in android - building UI completely in code, UI using XML, UI in XML with code, Android's common controls - Text controls, button controls, checkbox control, radio button controls, image view, date and time controls, map view control, understanding adapters, adapter views, list view, grid view, spinner control, gallery control, styles and themes, Understanding layout managers - linear layout manager, table layout manager, relative layout manager, frame layout manager, grid layout manager.

Unit IV [13T+3L]

Android menus - creating menus, working with menu groups, responding to menu items, icon menu, sub menu, context menu, dynamic menus, loading menu through XML, popup menus, Fragments in Android structure of fragment, fragment life cycle, fragment transaction and back stack, fragment manager, saving fragment state, persistence of fragments, communications with fragments, `startActivity()` and `setTargetFragment()`, using dialogs in android, dialog fragments, working with toast, Implementing action bar - tabbed navigation action bar activity, implementing base activity classes, tabbed action bar and tabbed listener, debug text view layout, action bar and menu interaction, list navigation action bar activity, spinner adapter, list listener, list action bar, standard navigation action bar activity, action bar and search view, action bar and fragments.

Unit V [12T+4L]

Persisting data - Files, saving state and preferences - saving application data, creating, saving and retrieving shared preferences, preference framework and preference activity, preference layout in XML, native preference controls, preference fragments, preference activity, persisting the application state, including static files as resources, Working with file system, SQLite - SQLite types, database manipulation using SQLite, SQL and database centric data model for Android, Android database classes.

References:

1. Satya Komatineni & Dave MacLean, *Pro Android 4*, Apress.
2. Retomeier, *Professional Android 4 Application Development*, Wrox.
3. Zigurd Mednieks, Laird Dornin, G. Blake Meike, and Masumi Nakamura, *Programming Android*, O'Reilly

MODEL QUESTION PAPER

SIXTH SEMESTER BCA DEGREE EXAMINATION APRIL 2020

MODEL QUESTION PAPER

SJBCA6B11 – ANDROID PROGRAMMING

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. What is android?
2. List any four fundamental components?
3. What do you mean by intent?
4. What is fragment?
5. What is the use of ADT?
6. What is activity?
7. AVD stands for.....
8. What is a widget?
9. List any two layout managers.
10. What is a popup menu?
11. What is content provider?
12. What is the use of intent?

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. How to implement SQLite database?
14. What do you mean by resource reference Syntax?
15. Describe about the environment setup of android.
16. List any 4 android widgets.
17. What do you mean by spinner?
18. What do you mean by R file?
19. Explain about android button with example

Section C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

20. Explain structure of android application and application life cycle?

21. How to setting up development environment of android?

Course Code: SJBCA6B12

Name of the Course: - Operating Systems

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)	Lab (Hrs)
CO1	Describe the important computer system resources and the role of operating system in their management policies and algorithms.	PSO2	U	F	10	2
CO2	Understand the process management policies and scheduling of processes by CPU	PSO2	U	F	10	2

CO3	Evaluate the requirement for process synchronization and coordination handled by operating system.	PSO2	E	F	11	2
CO4	Describe and analyze the memory management and its allocation policies	PSO2	Z	F	11	2
CO5	Identify use and evaluate the storage management policies with respect to different storage Management technologies.	PSO2	E	F	11	4
CO6	Identify the need to create the special purpose operating system.	PSO2	E	F	11	4

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA6B12- Operating Systems

Course Number: 31

Contact Hours per Week: 5 (4T + 1L) Number of Credits:

3

Number of Contact Hours: 80 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- To learn objectives & functions of Operating Systems.
- To understand processes and its life cycle.
- To learn and understand various Memory and Scheduling Algorithms.
- To have an overall idea about the latest developments in Operating Systems

Prerequisites

- Knowledge in Data structures.

Course Outline

Unit I [12T + 4P]

Operating System - Objectives and functions - The Evolution of Operating Systems: Serial Processing, Simple batch Systems, Multi Programmed batch Systems, Time Sharing Systems, Parallel Systems, Distributed Systems, Real time systems. Definition of Process, Process States, Process Control Block, Operations on Process, Process Communication, Communication in Client server System, Basic concepts of threads, Concurrency, Principles of Concurrency, Mutual exclusion, Semaphores, Messages, Dead lock: Prevention, Detection, Avoidance.

Unit II [13 T + 3P]

Linux Shell Programming: Introduction – Shells available in Unix: Bourne shell (sh), C shell (csh), TC shell (tcsh), Korn shell (ksh), Bourne Again SHell (bash). Bash: special characters – getting help – man pages – Linux Directory Layout – Command for Navigating the Linux Filesystems:

pwd, cd, ls, file, cat, cp, mv, mkdir, rmdir, whereis – Piping and Redirection - Informational Commands: ps, w, id, free – clear, echo, more. File permissions – Setting Permissions – Making a file executable. Creating shell programs: comments, variables, operators (arithmetic, relational, logical) – single and double quotes - read – echo – test - conditional commands, iterative commands – break – continue - evaluating expressions using expr, bc – strings – grep – arrays.

Unit III [13T + 3P]

CPU Scheduling: Scheduling Criteria, Scheduling algorithms: FCFS, SJF, Priority, RR, Multilevel, Feedback Queue - Process synchronization, The Critical Section Problem, Synchronization Hardware, Classical Problems of Synchronization: Reader Writer, Dining Philosopher. File and Database System, File System, Functions of organization, Allocation and Free Space Management.

Unit IV [13T + 3P]

Memory Management, Address Binding, Logical Vs Physical Address Space, Dynamic Loading, Dynamic Linking and Shared Libraries, Overlays, Swapping, Contiguous Memory allocation, Paging, Segmentation, Virtual memory, Demand Paging, Page Replacement, Thrashing.

Unit V [13 T + 3 P]

Protection and security: policy and mechanism, authentication, authorization. Mobile OS: Concepts, history, features, architecture, future scope. Case studies: Android, UNIX kernel and Microsoft Windows NT (concepts only).

Text Books

1. Silberschatz, Galvin and Gagne, Operating System Concepts, John Willey & Sons
2. William Stallings, Operating Systems, Internals and Design Principles, PHI
3. Mendel Cooper, Advanced Bash-Scripting Guide, Available at <http://www.tldp.org/LDP/abs/abs-guide.pdf>

References:

4. Nutt G.J, Operating Systems: A Modern Perspective, Addison Wesley

MODEL QUESTION PAPER

SIXTH SEMESTER BCA DEGREE EXAMINATION

MODEL QUESTION PAPER

SJBCA6B12 – OPERATING SYSTEMS

TIME: 2 HOURS

MAX: 60 MARKS

Section A – Short Answer type questions

(Answer all questions. Each correct answer carries a maximum of 2 marks. Ceiling 20 marks)

1. What is OS?
2. What is POST?
3. What PCB?
4. What are concurrent processes?
5. What do you mean by mutual exclusion?
6. Define distributed system?
7. What is virtual memory?
8. What is a file system?
9. What is a deadlock?
10. Define paging.
11. What do you mean by critical section?
12. Define fragmentation.

Section B – Short Essay type questions

(Answer all questions. Each correct answer carries a maximum of 5 marks. Ceiling 30 marks)

13. Briefly explain about OS as resource manager.
14. What is booting?
15. What do you mean by critical region?
16. Explain concurrent processing.
17. Explain spooling.
18. What are the functions of OS?
19. Explain the structure of the OS.

SECTION C – Essay type questions

(Answer any one question. Correct answer carries 10 marks)

20. Explain the concept of paging.

21. Explain the concept of deadlock in detail.

Course Code: SJBCA6B13

Name of the Course: - Computer Networks

	Course Outcome	POs/ PSOs	CL	KC	Class Sessions (appr.)
CO1	Describe the functions of each layer in OSI and TCP/IP model	PSO2	U	F	10
CO2	Explain the functions of Application layer and Presentation layer paradigms and Protocols.	PSO2	U	F	15
CO3	Describe the Session layer design issues and Transport layer services	PSO2	U	F	15

CO4	Classify the routing protocols and analyze how to assign the IP addresses for the given network.	PSO2	E	F	15
CO5	Describe the functions of data link layer and explain the protocols	PSO2	U	F	15
CO6	Explain the types of transmission media with real time applications	PSO2	U	F	10

***R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create**

***F-factual, C-conceptual, P-practical/procedural**

SJBCA6B13- Computer Networks

Contact Hours per Week: 5T

Number of Credits: 3

Number of Contact Hours: 80 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- To learn about transmissions in Computer Networks.
- To learn various Protocols used in Communication.
- To have a general idea on Network Administration.

Prerequisites

- Knowledge in data structure.
- Knowledge in Operating System.

Course Outline:

Unit I [16 T]

Introduction to Computer networks, Topology, categories of networks, Internetwork, Internet, Network Models, Layered model, OSI and TCP/IP models, Physical layer, Switching - Circuit switching, Packet Switching and Message Switching, DTE - DCE Interface, EIA - 232 interface, X.21 Modems. Transmission media: guided and unguided.

Unit II [16T]

Data link layer, Error detection and correction, Types of errors, Single CSC error and Burst error, Vertical redundancy check (VRC), longitudinal redundancy Check (LRC), Cyclic Redundancy Check(CRC), Error correction - Single CSC error correction, Hamming code Data compression - Huffman code, data link control, Line discipline, Flow control, Error control, Multiple Access, Random Access, ALOHA, pure ALOHA and slotted ALOHA, CSMA/CD and SCMA/CA, Polling, Wired LANs, Ethernet - IEEE standards, Wireless LANs.

Unit III [16T]

Network layer, Networking and Internetworking devices - Repeaters, Bridges, Routers, Gateways, Logical addressing - IPv4 & IPv6 addresses, Network Address Translation(NAT), Internet protocols, internetworking, Datagram, Transition from IPv4 to IPv6, Address Mapping-Error reporting and multicasting - Delivery, Forwarding and Routing algorithms, Distance Vector Routing, Link State Routing.

Unit IV [16 T]

Transport layer, Process-to-process Delivery: UDP, TCP and SCTP, Congestion control and Quality of Service, Application Layer, Domain Name Systems-Remote Login-Email FTP, WWW, HTTP, Introductory concepts on Network management: SNMP.

Unit V [16T]

Cryptography and Network Security: Introduction – Goals of Security – Attacks - Services and Techniques. Basics of Cryptography: Plain Text - Cipher Text – Encryption – Decryption. Confidentiality: Basics of Symmetric Key Ciphers - Traditional Symmetric Key Ciphers: Substitution, Transposition, Stream & Lock, Modern – Components of Modern Block Cipher – DES - Modern Stream Cipher. Basics of Asymmetric Key Ciphers – RSA Cryptosystem. Integrity: Message – Message Digest – Hash Function. Authentication: MAC. Digital Signature : Analogy with Manual Signature – Process – Signing the Digest – Services – RSA Digital SignatureScheme.

Textbook:

1. Behrouz A Forozan, *Introduction to Data Communications & Networking*, TMH

References:

1. Andrew S. Tanenbaum, Computer Networks, PHI
2. William Stallings, Data and Computer Communications, VIIth Edition, Pearson Education William Stallings, Cryptography and Network Security, Principles and Practices, Prentice Hall of India.
3. Steven Graham and Steve Shah, Linux Administration: A Beginners Guide, Third Edition, Dreamtech,2003.

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA

BCA - SEMESTER 6
SJBCA6B13 – COMPUTER NETWORKS

TIME: 3 HOURS

MAX: 80 Marks

PART A

*Answer **all** questions.
Each question carries 1 mark.*

1. What is router?
2. Define network topology.
3. Define network address translation.
4. What are the different types of errors?
5. Differentiate subnetting and supernetting.
6. Describe modem.
7. Define ARP.
8. Describe message and message digest.
9. What do you mean by cryptography?
10. Differentiate TCP and UDP?

(10X1=10 marks)

PART B

*Answer **all** questions
Each question carries 2 marks*

19. Explain the goals of network security.
20. What do you mean by congestion control?
21. What are the different classifications of CSMA?
22. Describe bridges.
23. Mention the functions of data link layer.
24. Explain digital signature.
25. Explain the various protocols used in network layer.
26. Explain checksum.

(8X2=16 marks)

PART C

*Answer any **six** questions
Each question carries 4 marks.*

19. What is switching? Explain about different switching techniques in detail.

20. Explain CSMA/CA with procedural flowchart.
21. Differentiate IPV4 and IPV6.
22. Explain the layers in TCP/IP protocol suite with neat diagram.
23. Explain different categories of computer networks.
24. Write notes on DTE-DCE interface.
25. Explain Transition from IPv4 to IPv6.
26. Differentiate between pure ALOHA and Slotted ALOHA.
27. Explain in detail sliding window protocol.

**(6X4=24
marks)**

PART D

Answer any

3 questions

Each question

carries 10

marks.

28. With the help of a neat diagram, explain ISO OSI reference model.
29. What are the different error detection methods? Explain CRC with suitable example.
30. Explain Data Encryption Standard (DES).
31. Explain Distance Vector routing algorithm with example.
32. Write notes on -- a) SNMP b) FTP c) HTTP

(3X10=30 marks)

Course Code: SJBCA6B14

Name of the Course: Programming Laboratory III: Java and PHP Programming

SJBCA6B14- Programming Laboratory III: Lab

**Exam of Vth Semester – Java and
PHP Programming**

Course Number: 33

Number of Credits: 4

Course Evaluation: Internal – 20 Marks + External – 80 Marks

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)	Lab (Hrs)
CO1	Practice Java programming.	PSO4	A	P	0	0
CO2	Practice client side and server side scripting.	PSO4	C	P	0	0
CO3	Practice PHP Programming.	PSO4	A	P	0	0
CO4	Practice developing dynamic websites.	PSO4	C	P	0	0
CO5	Practice how to interact with databases through PHP	PSO4	C	P	0	0

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

Objective

- To practice Java programming.
- To practice client side and server side scripting.
- To practice PHP Programming.
- To practice developing dynamic websites.
- To practice how to interact with databases through PHP.

Prerequisites

- Theoretical knowledge in Java programming.
- Theoretical knowledge of PHP Programming.

Course Outline

PART A – Java Programming

1. Write a program to find the distance between two points.
2. Write a program to find the sum, difference, product, quotient and remainder of two numbers passed as command line argument.
3. Write java program to display Fibonacci series up to a limit.
4. Write java program to display armstrong numbers within a range.
5. Given the sides of a triangle, write a program to check whether the triangle is equilateral, isosceles or scalene and find its area.
6. Read an array of 10 or more numbers and write a program to find the
 - a) Smallest element in the array
 - b) Largest element in the array
 - c) Second largest element in the array
7. Write a program to perform base conversion
 - a) Integer to binary
 - b) Integer to Octal
 - c) Integer to Hexadecimal
8. Write a program to verify De Morgan's Law
9. Write a program to merge two arrays.
10. Write a program to find the trace and transpose of a matrix.
11. Write java program to find the sum of the digits and reverse of a given number using class and objects.
12. Write a program to sort a set of n numbers using a class.
13. Create a class „Account“ to represent a bank account. Write a program to deposit and withdraw amounts from the account.
14. Using class and objects, Write a java program to find the sum of two complex numbers (Hint: Use object as parameter to function).

15. Create a class Time with hh, mm, ss as data members. Write a java program to find the sum of two time intervals (Hint: Use object as parameter to function).
16. Write a program to count and display total number of objects created to a class (Hint: static members).
17. Write a java program to find the volume of cube, rectangular box, cylinder using function overloading.
18. Create a class student with methods to read and display the student details. Create a derived class result with methods to read marks of 5 subjects. Write a java program to display the total and grade of students, creating objects of class result.
19. Create a class Employee with ID, Name Designation and Dept. Create a child class salary with Basic, HRA, DA and Allowance. Write a program to compute the net salary assuming that HRA is 1250, DA, Allowance are 110% and 35% of the Basic salary.
20. Write a program to demonstrate inheritance hierarchy by using class a base class shape and 'TwoDim' and 'ThreeDim' as sub classes. Create classes „square“ and 'triangle' derived from TwoDim and 'sphere and 'cube' derived from ThreeDim. A reference variable of shape is used to determine area of various shapes.
21. Write a program to demonstrate the order in which constructors are invoked in multilevel inheritance.
22. Create an abstract class shape with two data members and an abstract method area. Create two child classes rectangle and triangle. Write a program to display the area of the shapes.
23. Create an interface calculator having methods to perform basic arithmetic operation. Write a program to implement the interface to perform operation on integer and float values.
24. Create a class factorial with a method that accept a number and return its factorial in a package P1. Using the factorial class, write a program to find the factorial of a number.
25. Write a multi thread java program for displaying odd numbers and even numbers up to a limit (Hint : Implement thread using Runnable interface).
26. Write a multi thread java program for displaying numbers ascending and descending order (Hint: create thread by inheriting Thread class).
27. Write a program to handle arithmetic exception.
28. Create a user defined exception „MinBalExp“ to be invoked when the read number is less than a pre-set value.
29. Create a user defined exception „OddValExp“ to be invoked when the read number is an odd number.
30. Write a program to copy a file to another. Pass the file names as command line arguments.
31. Write a program to track keyboard events on an applet.
32. Write an applet to display a rectangle with specified coordinate and colour passed as parameter from the HTML file.
33. Create an AWT application to add, remove items in a list box.
34. Create an AWT application to select gender using radio buttons.
35. Design a window to accept the qualifications of a user using checkboxes.
36. Create an applet for a displaying smiling face.
37. Write a program to display ip address of the system.

38. Write a program to implement echo server (A server that echo the messages the client sends).
39. Create a database table employee (id, name, design, dept). Write a program to list the employees using JDBC.
40. Write a program to insert a new employee record to the above table.

PART B – PHP Programming

1. Design a website of an educational institution using framesets and links. A sample design is as shown below.

Top Frame	
Menu frame	Details frame

2. Design a webpage that illustrates the use of the following form controls: (i) input controls: single-line text, password, multi-line text. (ii) buttons: submit and reset.
3. Design a webpage that illustrates the use of the following form controls: (i) input controls: check box, radio button, select box (ii) buttons: submit and reset.
4. Design a webpage that illustrates the use of the following form controls: (i) input controls: datalist, multi-select box, grouped select box (ii) buttons: submit and reset.
5. Design a webpage that illustrates the use of field sets and legends.
6. Design a web page to demonstrate Border colors using internal CSS.
7. Design a web page to demonstrate Text alignment using CSS.
8. Design a web page to demonstrate inline CSS.
9. Design a webpage to invert the behavior of the <h1> to <h6> tags using external CSS.
10. Design a webpage for a simple image gallery.

JavaScript

11. Write a javascript program to perform find the area and circumference of a circle.
12. Write a javascript program to check whether a given number is perfect, abundant or deficient. Use alert box to display the output.
13. Write a javascript program to check whether the given sides can form a triangle. If yes, find the type (isosceles, equilateral and scalene) and area of the triangle. Use prompt dialogue box to accept the sides.
14. Write a javascript program to display the nth prime number. Value of n should be accepted from the user. Validate the value entered by the user: Only positive numbers except 0 are to be accepted.
15. Write a JavaScript program to find all years in which 1st January is a Sunday between a given range (eg:- between 2010 and 2017). Use
16. Design a webpage to illustrate image rollover.

17. Design a JavaScript program to illustrate the following events: onLoad, onClick, onBlur, onSubmit, onChange.
18. Design a JavaScript program to display the multiplication table of a no accepted from the user.
19. Design a form that accepts two integers. Provide 4 buttons for Add, Subtract, Multiply, Divide. Add JavaScript program to add, subtract, multiply and divide the given numbers when these buttons are clicked. Use output element to display the results.
20. Write a JavaScript program to create a table after accepting row and column numbers from the user. Contents of each cell should be corresponding row-column number (e.g. Row-0 Column-0).
21. Write a JavaScript program to store different colors in an array and change the background color of the page using this array elements
22. Write a JavaScript program to create clock with a timing event.
23. Write a JavaScript program for form validation for question numbers 2, 3 and 4.
24. Design a webpage to demonstrate the use of **progress** HTML element.

PHP

25. Write a PHP program to check whether the given number is Armstrong or not.
26. Write a PHP program to check whether a given number is perfect, abundant or deficient.
27. Display the Fibonacci series up to a given number.
28. Create a php program to display the bio data of a person by reading the personal details using an HTML page.
29. Create a login page using database.
30. Create a mysql table student with fields roll no, name, mark, grade. Insert records in the table. Write a PHP program to display the mark list of a student by accepting the register no of the student.
31. Write a php application to generate the pay slip of an employee by accepting name, basic salary and designation. The net salary will be calculated based on the following conditions.

Designation	conveyance allowance	extra allowance
Manager	1000	500
Supervisor	750	200
Clerk	500	100
Peon	250	

HRA – 25 %

Income tax

Gross <=200	0
2500 < gross <=4000	3%
4000 < gross <=5000	5%
Gross >5000	8%

Gross= basic + HRA + conveyance + extra

Net = gross – income tax

32. Create a table “product” with fields itemcode, itemname, unitprice. Write php program to insert 5 records into the table and display it in a table format.
33. Write a php program for delete and update operation on account table. The account table contain fields such as accountno, name and amount.
34. Write an HTML page to display a list of fruits in a list box. Write php program to display the names of the fruits which are selected by the user.
35. Write php program to store current date/time in a cookie and display the „last visited on,, date time on the web page upon reopening of the same page.
36. Design a PHP page to implement a login screen using sessions. Login details are to be verified from the server side with values stored in a database.
37. Write a php program to create an array and store 10 names in the array. Do the following operations.
 - a. Display the contents using for each statement.
 - b. Display the array in a sorted order.
 - c. Display the array without the duplicate elements
 - d. Remove the last element and display
 - e. Display the array in reverse order
 - f. Search an element in the given array.
38. Design a PHP page to illustrate the use of **keygen** HTML element.
39. Design a PHP page to illustrate the use of **meter** HTML element – accept five cities and the temperature of those cities and display the result graphically.
40. Design a PHP page to illustrate the use of file upload – uploading files of a type with a specified size to the webserver.

Include any 20 Java Programming Lab questions and 20 PHP Programming Lab questions in the record book.

Course Code: SJBCA6B15

Name of the Course: Programming Laboratory IV: Android and Linux Shell Programming

SJBCA6B15- Programming Laboratory IV: Lab Exam of VIth

Semester – Android and Linux Shell Programming

Course Number: 34

Number of Credits: 4

Course Evaluation: Internal – 20 Marks + External – 80 Marks

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)	Lab (Hrs)
CO1	Practice Android programming.	PSO4	A	P	0	0
CO2	Practice user interface applications.	PSO4	C	P	0	0
CO3	Develop mobile application.	PSO4	A	P	0	0
CO4	Practice developing dynamic To practice shell programming	PSO4	C	P	0	0

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

**SJBCA6B15- Programming Laboratory IV: Lab Exam of VIth Semester –
Android and Linux Shell Programming**

Objective

- To practice Android programming.
- To practice user interface applications.
- To develop mobile application.
- To practice shell programming

Prerequisites

- Theoretical knowledge in Android programming.
- Theoretical knowledge of Shell Programming.

Course Outline

PART A – Android Programming

1. Programs to understand basic arithmetic operations
2. Programs to understand basic logic operations
3. Programs to understand loops and control statements
4. Programs to understand GUI in android
5. Android application for adding two numbers
6. Develop simple user interface to display message
7. Create two menu items-opening a file-saving a file
8. Inserting values into Spinner control using Text view and Button.
9. Implementation of background image
10. Starting another activity from your own activity using intent
11. Create a new activity that services ACTION-PICK for contact data which display each of the contact in the contact database and lets the user to select one before closing and returning the selected contacts URL to the calling activities
12. Create Android application to linkify a text view to display web and E-mail address as hyperlinks. When clicked they will open the browser and E-mail address respectively
13. Implementation of array adapter
14. Create an alert dialogs used to display a message and offer two button options to continue. Clicking either button will close the dialog after executing the attached click listener
15. Get data from Text view control and insert into database using SQLite. Another activity shows inserted data in a List View control
16. Load menu item by parsing XML data.
17. Program to implement simple calculator

18. Program to Get IP Address
19. Program to Home and Lock Screen Widget (Temperature Widget)
20. Create a new contact using intent
21. A Button control shows Date picker and Text view control displays selected date.
22. Insert data into Spinner and delete selected item using SQLite.
23. Program to create simple login screen.
24. Create an Android application to display the map of your locality. Use ACTION_VIEW intent by passing latitude and longitude as parameters.
25. Create an Android application to convert a voice into text (using Google Speech to Text service)
26. Create an Android application to populate a list view by getting names & numbers from a SQLite database table.
27. Display the saved contacts available in the android phone in a listview using content providers
28. Create an image grid. Images should be placed under the resources section.
29. Create an android app with three tabs. First tab should contain two Edit text and that should accept age and name. In the second tab you need another 3 edit texts that accept education address and phone number. After these information is proved, when the third tab is open it should display all the provided information neatly.
30. Create a custom toast with an Image and a TextView.
31. Apply a Custom List style to a ListView. ListView should have at least 10 Items.
32. Determine the acceleration of your android device along all three axes using accelerometer? (i.e. x,y,z).
33. Capture an Image from the primary camera of an android device and save that picture into the internal storage.
34. Create an app to list files under a given folder name in an EditText
35. Fetch data from an arbitrary URL given in an EditText and display it in a TextView
36. Create an SQLite database named student. Accept student details from the MainActivity and save it in the table called student. Display the calculated result in the second activity when a button on the MainActivity is clicked.
37. Create an android app to switch the wifi on and off also illustrate the use of permission in android?
38. Create a spinner that takes data from the String.xml file.
39. Create a simple android application that opens the default messaging application available in the android device?
40. Create an app to display message in the notification bar?

PART B – Shell Programming

1. Write a script to find area of a circle
2. Write a shell script to find given number is even or odd
3. Write a shell script to make a menu driven calculator using case
4. Write a shell script to find the greatest of three numbers
5. Write a shell script to compute mean and standard deviation of three numbers
6. Write a shell script to find sum of all digits from a given number
7. Write a shell script to find reverse of a number
8. Write a shell script to find prime numbers upto a given number
9. Write a shell script to find n fibonacci numbers
10. Write a shell script to check whether a given number is Armstrong or not
11. Write a shell script to reverse a string and check whether a given string is palindrom or not
12. Write a shell script to count no of line, words and characters of a input file
13. Code for Write a shell program to convert all the contents into the uppercase in a particular file in Unix
14. Write a script to find the value of one number raised to the power of another. Two numbers are entered through the keyboard.
15. Write a shell script find the factorial of a given number
16. An employee Basic salary is input through keyboard where da is 40% of basic salary and hra is 20% of basic salary. Write a program to calculate gross salary
17. Write a shell script to find the average of the number entered as command line arguments
18. Code for Shell script which whenever gets executed displays the message "Good Morning/Good afternoon /Good Evening "depending on the time it get executed"
19. Write a shell script to Display Banner, calander of given year
20. Code for a program to display current date and time, number of users , terminal name, login date and time
21. Write a shell script which uses all the file test operators
22. Write a shell script to copy the contents of file to another. Input file names through command line. The copy should not be allowed if second file exists.
23. Write a shell script to find number of vowels, consonants, numbers in a given string.
24. Code for Shell script to perform operations like display, list, make directory and copy, rename, delete
25. Write a shell script to compare two files and remove one of them if they are same

Include any 15 Android Programming Lab questions and 15 Shell Programming Lab questions in the record book.

SJBCA6B16X Elective Course

Course Code: SJBCA6B16A

Name of the Course: - System Software

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Distinguish different software into different categories	PSO2	U	F	12
CO2	Design, analyze and implement one pass, two pass or multi pass assembler	PSO2	Z	F	15
CO3	Design, analyze and implement loader and linker	PSO2	Z	F	12
CO4	Design, analyze and implement macro processors	PSO2	Z	F	10
CO5	Critique the features of modern editing /debugging tools.	PSO2	U	F	15

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCA6B16A -System Software

Contact Hours per Week: 4T

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To build fundamental knowledge in system software.
- To learn functions of various system software.
- To learn specifically learn compilation process of a program.

Prerequisites

- Basic knowledge in Programming.

Course Outline:

Unit I [12T]

System software: General concept, Assemblers, loaders, linkers, macros, compilers, interpreters, operating system, Design of assemblers.

Macros and macro processors, Macro definitions and instructions, Macro calls, Features of Macros,

Design of Macro processors.

Unit III [13T]

Loading, linking and relocating Loader schemes- Binders, linking loaders, overlays, dynamic binders- Dynamic loading and dynamic linking – Relocatability of programs.

Unit IV [13T]

Compilers - Phases of a compiler - Lexical, Syntax, Intermediate code generation, Optimization, Code generation, Symbol table and error correcting routines – Passes of a compiler.

Unit V [13T]

Case studies of lexical and syntax analyzers: LEX and YACC.

References:

1. D.M. Dhamdhere, *Systems Programming and Operating Systems*
2. John J Donovan, *Systems programming*
3. Jim Welsh and R M Mckeag, *Structured System Programming*, Prentice Hall.
4. *Principal of Compiler Design*, Alfred Aho V and Jeffrey D Ullman, Addison- Wesley Publications.
5. L Lbech, *System Software*

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS)

**IRINJALAKUDA BCA - SEMESTER 6
MODEL QUESTION PAPER
SJBCA6B16A – SYSTEM SOFTWARE**

TIME: 3 HOURS

MAX: 80 Marks

PART A

*Answer **all** questions.*

Each question carries 1 mark.

1. What is an interpreter?
 2. What is a language translator?
 3. Define System Software.
 4. What is meant by a literal.
 5. What is the function of DC pseudo op.
 6. What are the entries in a symbol table.
 7. What is linked origin.
 8. What is the function of a MNT.
 9. What is the use of AGO pseudo op.
 10. What is the function of an EXTRN statement in an assembly language program.
- (10X1=10 marks)**

PART B

*Answer **all** questions*

Each question carries 2 marks

27. What are assembler directives? Give examples.
28. Define a Macro.
29. What is a YACC.
30. Define absolute loader.
31. What is meant by a binary program.
32. What are the different components in an object module.
33. What is the function of a symbol table.
34. How can we call a macro?

(8X2=16 marks)

PART C

*Answer any **six** questions*

Each question carries 4 marks.

19. Differentiate between syntax analysis and semantic analysis.
20. What is meant by a loader. Explain.
21. Explain macro expansion with example.
22. Explain program relocation with example.
24. What is meant by dynamic loading?
25. Describe the data structures used by an assembler
26. Explain different views of a System software.
27. Discuss the code optimization phase in a compiler .
28. Explain the structure of LEX.

(6X4=24 marks)

PART D

*Answer any **three** questions*

Each question carries 10 marks.

29. Explain pass 1 algorithm of an assembler.
30. Explain different loader schemes in detail.
31. Explain different features of macros.
32. Explain different phases of a compiler with a neat diagram.
33. Describe the data structures used in pass one macro processor algorithm? Give the algorithm for pass one macro processor.

(3X10=30 marks)

Course Code: SJBCA6B16B

Name of the Course: - Machine Learning

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Get good comprehension of the major issues and difficulties of machine learning :data, model selection, model complexity, etc.	PSO1	U	C	17
CO2	Have a comprehension of the qualities and shortcomings of numerous famous machine learning approaches like Predictive analytics and machine learning	PSO1	Z	C	17
CO3	Appreciate the underlying mathematical relationships within and across Machine Learning algorithms	PSO3	Z	P	15
CO4	Be able to design and implement various machine learning algorithms in real-world applications	PSO4	A	P	15

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCA6B16B

Machine Learning

Number of Contact Hours: 64

Number of Credits: 3

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- To familiarize with the basic concepts of Linear Algebra, Probability Theory for Machine Learning.
- Introduce Machine Learning to the graduates and enable them think more scientifically

Outcome

- The students will be able to understand machine learning concepts
- They also get the essential mathematical and statistical foundations of machine learning

Course Outline

Unit I [12 T]

Basics of Linear Algebra for ML : Classes of spaces (vector , metric , normed , inner product), Pythagorean Theorem, Type of matrices, Matrix operations, Eigenvector, Fundamental Theorem of Linear Algebra.

Unit II [13 T]

Foundations of Probability for ML : Probability Theory (Random Variables, Distributions, Mean and Variance, Bayes Rule), Basic Techniques (Naive Bayes, Nearest Neighbor Estimators, K-Means), Density Estimation (Limit Theorems, Parzen Windows, Exponential Families, Estimation, Sampling).

Unit III [13 T]

Introduction to Machine Learning : Applications, Issues in Machine Learning, Designing a Learning system - Supervised Learning - Unsupervised Learning, Vapnik-Chervonenkis Dimension – Probably Approximately Correct (PAC) Learning- Learning Multiple Classes, Bayesian Decision theory- Classification, Discriminant Functions, Association rules.

Unit IV [13 T]

Dimensionality Reduction : Subset Selection-Principal Component Analysis-Linear Discriminant Analysis, Clustering- K-means Clustering- Expectation maximization Algorithm- Hierarchical Clustering.

Unit V [13 T]

Parametric and Non-Parametric methods for classification and regression : Parametric methods-Maximum Likelihood Estimation-Bayes's Estimator-Parametric Classification, Regression, Non-Parametric methods- Kernel Estimator- K-nearest neighbour estimator, Decision Trees-Univariate Trees-Classification trees, Regression trees, Rules extraction from Trees

References

1. Ethem Alpaydm, Introduction to Machine Learning, Second edition, MIT Press, 2010.
2. Alex Smola and S.V.N. Vishwanathan ,Introduction to Machine Learning, Second Edition, Cambridge University Press
3. Jason Brownlee, Basics of Linear Algebra for Machine Learning, First Edition, Machine Learning Mastery, 2018
4. Bishop. C M, Pattern Recognition and Machine Learning. Springer, 2006.
5. Duda, R O, Hart P E and Stork D G. Pattern Classification. Wiley-Interscience, 2nd Edition, 2000.
6. Hastie T, Tibshirani R and Friedman J, The Elements of Statistical Learning: Data Mining, Inference and Prediction. Springer, 2nd Edition, 2009.
7. Mitchell T, Machine Learning. McGraw Hill, 1997.
8. Mohssen Mohammed, Muhammad Badruddin Khan ,Eihab Bashier Mohammed Bashier, Machine Learning Algorithms and applications, CRC Press, First Edition, 2017

Online References

MIT Open Courseware, Stanford Machine Learning Courses, IISc Machine Learning, IIT Kharagpur, Bombay and Delhi ML Courses



ST. JOSEPH'S COLLEGE (AUTONOMOUS)

**IRINJALAKUDA BCA - SEMESTER 6
MODEL QUESTION PAPER**

SJBCA6B16B – MACHINE LEARNING

TIME: 2.5 HOURS

Max:60 marks

PART A ,

you may answer all ,each carries 2 marks ,ceiling 20 marks

1. Define Pythagorean Theorem
2. What are the different types of matrices
3. What do you mean by linear algebra?
4. What is machine learning?
5. Differentiate mean and variance?
6. What do you mean by Probably Approximately Correct (PAC) Learning?
7. What is hierarchical clustering?
8. Analyse Maximum Likelihood Estimation.
9. Evaluate Discriminant Functions.
10. Define parametric methods.
11. What is Kernel Estimator?
12. Evaluate Limit Theorems.

PART B,

you may answer all , each carries 5 marks ,ceiling 30 marks

13. Write short note on Bayesian Decision theory.
14. Explain different types of matrices and its operations.
15. Explain any two Basic Techniques of Machine learning
16. Explain Hierarchical Clustering,
17. How to extract rules from trees?
18. Define supervised learning and unsupervised learning in machine learning with examples.
19. Explain Association rules.

PART C

Answer any one, 10 marks

20. How to apply K -means and clustering in machine learning?
21. Explain Decision trees with an example.

Course Code: SJBCA6B16C

Name of the Course: - Software testing & Quality Assurance

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Demonstrate the quality management, assurance, and quality standard to software system.	PSO2	U	F	15
CO2	Demonstrate Software Quality Tools and analyze their effectiveness	PSO2	Z	F	15
CO3	Describe fundamental concepts of software quality assurance.	PSO1	U	F	12
CO4	Apply a wide variety of testing techniques at various testing levels.	PSO4	A	C	12
CO3	Demonstrate the quality management, assurance, and quality standard to software system.	PSO2	E	F	10

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCA6B16C- Software testing & Quality Assurance

Course Number: 35

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Course Outline

UNIT I (12T)

Phases of Software project - Quality Assurance, Quality control - Testing, Verification and Validation - Process Model to represent Different Phases - Life Cycle models. White-Box Testing: Static Testing - Structural Testing Challenges in White-Box Testing.

UNIT II (12T)

Black-Box Testing: What is Black, Box Testing?, Why Black, Box Testing?, When to do Black, Box Testing?, How to do Black, Box Testing?, Challenges in White Box Testing, Integration Testing: Integration Testing as Type of Testing, Integration Testing as a phase of Testing, Scenario Testing, Defect Bash.

UNIT III (12T)

System and Acceptance Testing: system Testing Overview, Why System testing is done? Functional versus Non, functional Testing, Functional testing, Non, functional Testing, Acceptance Testing, Summary of Testing Phases.

UNIT IV (12T)

Performance Testing: Factors governing Performance Testing, Methodology of Performance Testing, tools for Performance Testing, Process for Performance Testing, Challenges.

Regression Testing: What is Regression Testing? Types of Regression Testing, When to do Regression Testing, How to do Regression Testing, Best Practices in Regression Testing.

UNIT V (12T)

Test Planning, Management, Execution and Reporting: Test Planning, Test Management, Test Process, Test Reporting, Best Practices. Test Metrics and Measurements: Project Metrics, Progress Metrics, Productivity Metrics, Release Metrics.

REFERENCE BOOKS

1. Software Testing Principles and Practices, Srinivasan
Desikan & Gopalswamy, Ramesh, Pearson Education.
2. Effective Methods of Software Testing, William E. Perry, Wiley
3. Software Testing, Renu Rajani and Pradeep Oak, TMH
4. Software Testing Tools, K. V. K. K. Prasad, Dreamtech Press
5. Introducing Software Testing, Louise Tamres, Pearson Education



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA
BCA - SEMESTER 6
SJBCA6B16C- Software testing & Quality Assurance
MODEL QUESTION PAPER

TIME: 2.5 HOURS

Max:60 marks

PART A

you may answer all , each carries 2 marks ,ceiling 20 marks

1. Differentiate between Verification and Validation.
2. Analyse static testing .
3. Why we need black box testing?
4. What is defect bash?
5. How can we perform integration testing?
6. Why functional testing is important in software development?
7. What is Scenario Testing?
8. Analyse Functional versus Non functional Testing.
9. Evaluate the need testing.
10. Explain the Process for Performance Testing
11. How to do Black Box Testing?
12. What are the challenges of performance testing?

PART B

you may answer all , each carries 5 marks ,ceiling 30 marks

13. Differentiate between Unit testing and integration testing?
14. Why we do testing ?Explain the need of tresting?
15. What is Test Management?
16. Explain Test Metrics and Measurements.
17. What are the different tools for Performance Testing?
18. What are the Challenges in White Box Testing?
19. Differentiate alpha testing and beta testing?

PART C

Answer any one, 10 marks

20. What is Regression Testing? Explain Types of Regression Testing?
21. Explain white box testing in detail.

Course Code: SJBCA6B16D

Name of the Course: - Technical Writing

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Recognize, explain, and use the theoretical strategies and the formal elements of these specific genres of technical communication: technical abstracts, data based research reports, instructional manuals, technical descriptions, web pages, wikis, and correspondence.	PSO2	U	F	17
CO2	Students will actually able to create a bunch of reports identified with innovation and writing in the workplace and will have improved their ability to write clearly and accurately.	PSO2	Z	F	17
CO3	Students will understand the basic components of definitions, descriptions, process explanations, and other common forms of technical writing.	PSO1	U	F	15
CO4	Students will be familiar with basic technical writing concepts and terms, Constituents of Technical Written Communication: Word formation, Prefix and Suffix; Synonyms and Antonyms; Homophones; One Word Substitution; Technical Terms.	PSO1	A	F	15

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCA6B16D – Technical Writing

Course Number: 35

Contact Hours per Week: 4T Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- Acquire the skills and knowledge for professional technical communication, web content writing, soft skill development and search engine optimization.

Prerequisites

- Basic communication skills in English.

Course Outline

Unit I [13 T]

Basics of Technical Communication: Technical Communication - features; Distinction between General and Technical communication; Language as a tool of communication; Levels of communication: Interpersonal, Organizational, Mass communication; the flow of Communication: Downward, Upward, Lateral or Horizontal (Peer group); Barriers to Communication.

Unit II [13 T]

Constituents of Technical Written Communication: Word formation, Prefix and Suffix; Synonyms and Antonyms; Homophones; One Word Substitution; Technical Terms; Paragraph Development: Techniques and Methods –Inductive, Deductive, Spatial, Linear, Chronological etc; The Art of Condensation- various steps.

Unit III [12 T]

Forms of Technical Communication – Business Letters: Sales and Credit letters; Letter of Enquiry; Letter of Quotation, Order, Claim and Adjustment Letters; Memos, Notices, Circulars; Job application and Resumes.

Unit IV [13 T]

Reports: Types; Significance; Structure, Style & Writing of Reports. Technical Proposal; Parts; Types; Writing of Proposal; Significance, Technical Paper, Project, Dissertation and Thesis Writing. E-Media: E-mail – E-Newsletter – Blogging – E-Magazines – Social Networks.

Unit V [13 T]

Soft Skills: Presentation Strategies – Preparing a Presentation – Body Language – Voice Dynamics – Handling Questions.

Text Books

1. Professional Communication: For GautamBuddh Technical University & Mahamaya Technical University, Pearson Education India.
2. Phillip A. Laplante, Technical Writing: A Practical Guide for Engineers and Scientists (What Every Engineer Should Know), CRC Press.

References

1. Gerald J. Alred ,Charles T. Brusaw, Walter E. Oliu, Handbook of Technical Writing, Tenth Edition.
2. Gary Blake and Robert W. Bly, The Elements of Technical Writing, New York: Macmillan Publishers.
3. Hackos, JoAnn T., Managing Your Documentation Projects. Wiley, 1994.



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA
SJBCA6B16D - SEMESTER 6

Technical Writing
MODEL QUESTION PAPER

TIME: 2.5 HOURS

Max:60 marks

PART A ,

you may answer all , each carries 2 marks ,ceiling 20 marks

1. Define Technical Communication.
2. What is Social Networks
3. How Body Language helps in communication.
4. What are the peculiarities of Notices?
5. How memo helps in communication?
6. What do you mean by effective communication?
7. What do you mean by Letter of Quotation
8. What is Technical Proposal?
9. What is E-Newsletter?
10. Analyse how Soft Skills helps in effective communication.
11. What is a Circular?
12. Explain the Process of communication

PART B,

you may answer all , each carries 5 marks ,ceiling 30 marks

13. What are the different Levels of communication ?
14. Explain different Barriers to Communication.
15. Explain the flow of Communication?
16. How Business Letters differ from Sales and Credit letters
17. Analyse the Structure, Style & Writing of Reports.
18. What are the Constituents of Technical Written Communication
19. Explain Claim and Adjustment Letters?

PART C , Answer any one, 10 marks

20. Please suggest the best ways/methods/techniques to learn/improve "Scientific or Technical Writing".?
21. Explain the Art of Condensation.

Course Code: SJBCA6B16E

Name of the Course: - Fundamentals of Life Skills Education

	Course Outcome	Pos/ PSOs	C L	K C	Class Sessions (appr.)
CO1	To translate performance of skills into efficient habits	PSO2	U	F	12
CO2	Use appropriate thinking and problem solving techniques to solve new problems	PSO2	Z	F	12
CO3	To make students learn and practice the steps involved in time management	PSO4	E	P	12
CO4	To make the students to learn Self-management, self esteem.	PSO1	U	F	12

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCA6B16E - Fundamentals of Life Skill Education

Course Number: 35

Contact Hours per Week: 4T

Number of Credits: 3

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objectives

- Develop intra-personal, inter-personal, critical thinking, decision making and communication skills.
- Establish self-management and help to maintain work life balance.
- Get an insight to career planning and development

Course Outline

Unit I [13 T]

Introduction to life skill education, definition, components, pillars of learning, need for life skill training, approaches - critical thinking skills/decision making skills, interpersonal/communication skills, criteria for using life skills.

Unit II [13 T]

Communication skills, communication, definition , components- sender, message, channel , receiver, feedback, types of communication, effective interpersonal communication, barriers, communication noise, listening, ways to improve interpersonal communication, effective public speaking interview, group discussion

Unit III [13 T]

Career planning, career planning steps, choosing a career, career development, career guidance and career guidance centre, need and importance of career guidance, career guidance centre and sources, making a career decision, preparing a resume and tips

Unit IV [12 T]

Self management, self esteem, definitions, practice self acceptance, practice self acceptance characteristics of people with high self-esteem, low self esteem, characteristics and causes, self-esteem building, self awareness importance, develop self awareness, self control, developing self control, emotional intelligence or emotional quotient, emotional quotient , two aspects of emotional intelligence, five domains of emotional eq or ei, social intelligence, coping with emotions, emotional intelligence,

Unit V [13 T]

Stress and strain: concept of stress, meaning and definition of stress, types of stress, major symptoms of stress, manage everyday stress. strain-mental strain, causes of strain, conflict, conflict resolution, understanding conflict in relationships, emotional awareness, managing and resolving conflict, stages of healthy conflict resolution, styles of conflict resolution, styles of dealing with conflict, developing positive thinking, positive and negative self-talk, better self-talk, impacts , assertiveness, behaviour , importance of assertive behaviour.

Text Books

1. Shalini Verma, Development of Life Skills and Professional Practice , Vikas Publishing House; First edition (2014)

References:

1. Dr. K. Ravikanth Rao and Dr. P. Dinakar, Life Skills Education, Neelkamal; First edition (2016)
2. http://www.universityofcalicut.info/SDE/opencourses/Life_skill_education.pdf

Open Courses (XXX5DXX)

Course Code: SJBCS5D01

Name of the Course: Introduction to Computers and Office Automation

	Course Outcome	Pos/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Students will be able to perform documentation ,accounting operations , presentation skills	PSO1	U	F	15
CO2	Utilize the Internet Web resources and evaluate on-line e-business system.	PSO2	Z	F	15
CO3	Solve common business problems using appropriate Information Technology applications and systems	PSO2	E	P	13
CO4	Utilize web technologies.	PSO2	C	P	13

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCS5D01-Introduction to Computers and Office Automation

Course Number: 29

Contact Hours per Week: 3 T

Number of Credits: 3

Number of Contact Hours: 48 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To learn Office Automation.

Prerequisites

- Basic knowledge in Computer & Internet.

Course Outline

Unit I [12T]

Introduction to Computers: Types of Computers - Desktop, Laptop, Notebook and Netbook. Hardware: CPU, Input / Output Devices, Storage Devices – System - Software - Operating Systems, Programming Languages, Application Software - Networks - LAN, WAN - Client - Server.

Unit II [12T]

Documentation Using a Word Processor (OpenOffice Writer / M.S. Word) - Introduction to Office Automation, Creating & Editing Document, Formatting Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Document Dictionary, Page Formatting, Bookmark, Advance Features - Mail Merge, Macros, Tables, File Management, Printing, Styles, linking and embedding object, Template.

Unit III [12T]

Electronic Spread Sheet (Open Office Calc/MS-Excel) - Introduction to Spread Sheet, Creating & Editing Worksheet, Formatting and Essential Operations, Formulas and Functions, Charts, Advanced features – Pivot table & Pivot Chart, Linking and Consolidation

Unit IV [12T]

Presentation using (OpenOffice Impress/MS-Power Point): Presentations, Creating, Manipulating & Enhancing Slides, Organizational Charts, Charts, Word Art, Layering art Objects, Animations and Sounds, Inserting Animated Pictures or Accessing through Object, Inserting Recorded Sound Effect or In-Built Sound Effect.

References:

1. Michael Miller, *Absolute Beginner's Guide to Computer Basics*, Prentice Hall.
2. Russell A. Stultz, *Learn Microsoft Office*, BPB Publication.
3. H.M.Deitel, P. J. Deitel, et al., *Internet & World Wide Web - How to program*, Prentice Hall.

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS)

IRINJALAKUDA BCA - SEMESTER 5

MODEL QUESTION PAPER

SJBCS5D01 – Introduction to Computers and Office Automation

TIME: 2 HOURS

MAX: 40 Marks

PART A

Answer all questions.

Each question carries 1 mark.

1. is a collection of programs.
2. What is a cell in Excel?
3. Spreadsheet application of Open Office is
4. RAM stands for.....
5. is a predesigned presentation you can use to create a new slide
6. Special effects used to introduce slides in a presentation are known as
7. Thealways initiates a connection to the server in a client- server model and requests for some services.
8. Shortcut for Find and Replace is.....
9. Identifies a location or a selection of text that you name and identify for future reference in MS word.
10. In Excel, Columns are labelled as.....

(10X1=10 marks)

PART B

Answer all questions

Each question carries 2 marks

11. Why is CPU called as the brain of the computer?
12. What Is a Hyperlink in MS Word?
13. What are the four types of animations in Power Point?
14. How to create pivot charts in Spread Sheet?
15. What are the different slide views in Power Point?

(5X2=10 marks)

PART C

*Answer any **five** questions*

Each question carries 4 marks.

16. Differentiate System Software and Application software with examples.
17. What is meant by Mail Merge? Explain its steps.
18. Explain the mathematical functions in Excel with suitable examples.
19. Write about Slide Transitions in Power Point
20. Write about the Organization of Computer.
21. Write about animations in PowerPoint
22. Explain the following advanced features of a word processor
 - a) Macros b) Template c) Tables d) Styles
23. Explain Data Filters in Excel

(5X4=20 marks)

Course Code: SJBCS5D02

Name of the Course: - Web Designing

	Course Outcome	Pos/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Students will discover how does web works really, what makes web sites work.	PSO2	U	F	15
CO2	Students will be able to add lists, styles and themes, linking pages, working with images to an active web page.	PSO2	Z	F	15
CO3	Students are able to develop a dynamic webpage by the use of java script and DHTML.	PSO4	C	P	13
CO4	Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.	PSO4	E	P	13

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCS5D02 – Web Designing

Course Number: 29

Contact Hours per Week: 3 T

Number of Credits: 3

Number of Contact Hours: 48 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To learn Web designing.

Prerequisites

- Basic knowledge in Computer & Internet.

Unit I [12T]

DHTML: Introduction, DHTML technologies, elements of DHTML, document object model, events - window events, form events, keyboard events, mouse events, style sheets, properties used in style sheets - background properties, positioning properties.

Unit III [12T]

Javascript: Introduction and advantages of javascript, java script syntax, writing javascript in html, javascript operators, arrays and expressions, programming constructs - for .. in loop, while loop - dialog boxes and prompts - alert, prompt, confirm methods - functions - built-in functions and user defined functions, scope of variables, handling events, using event handlers and event methods, form object, properties, methods, form element's properties and methods.

Unit IV [12T]

HTML Editor: Introduction, advantages, creating, opening, saving a web page, building forms, formatting and aligning text and paragraph, adding lists, styles and themes, linking pages, working with images, frames.

Reference:

1. H. M. Dietel, *Internet and World Wide Web*, Pearson.

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS)

IRINJALAKUDA BCA - SEMESTER 5

MODEL QUESTION PAPER

SJBCS5D02 – Web Designing

TIME: 2 HOURS

MAX: 40 Marks

PART A

Answer all questions.

Each question carries 1 mark.

1. Define HTML?
2. What is empty tag?
3. What are the different tags used to create a table?
4. What is JSP?
5. Define meta data.
6. How to insert image in an HTML page
7. What do you mean by hyperlink?
8. Analyze the term event.
9. Name any two HTML Editors.
10. Why we use confirm method?

(10X1=10 marks)

PART B

Answer all questions

Each question carries 2 marks

11. Write syntax for while loop.
12. Explain the method of writing javascript in html.
13. What are the properties used in style sheets.
14. What are different elements of DHTML.
15. What is document object model,

(5X2=10 marks)

PART C

*Answer any **five** questions*

Each question carries 4 marks.

16. What are the different formatting tags in HTML.
17. Differentiate between ordered list and unordered list
18. What are the advantages of javascript.
19. Explain any two events in javascript.
20. Explain tables with an example.
21. Analyse the need of dialog boxes and prompts.
22. Explain background properties, positioning properties in style sheet.
23. Explain form element's properties and methods.

(5X4=20 marks)

Course Code: SJBCS5D03

Name of the Course: -Introduction to Problem Solving and C Programming

	Course Outcome	POs/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Understand the problem and identify the tools and programming structure to logically solve the problem.	PSO3, PSO4	U	P	5
CO2	Understand the basic concepts of Programming language C including variables and operators.	PSO3, PSO4	U	P	5
CO3	Choose appropriate conditional and iteration constructs for a given programming task.	PSO3,PS O4	C	P	6
CO4	Apply the techniques of structured(functional)decomposition to break a program into smaller pieces.	PSO3,PS O4	A	P	6
CO5	Understand memory management using pointers	PSO3,PS O4	U	P	6
CO6	Design,implement, test,and debug a program that uses each of the following fundamental programming constructs:basic computation, simple I/O,standard conditional and iterative structures, and the definition of functions.	PSO3,PS O4	E	P	6

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCS5D03 - Introduction to Problem Solving and C Programming

Course Number: 29

Contact Hours per Week: 3 T

Number of Credits: 3

Number of Contact Hours: 48 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To introduce fundamental principles of Problem Solving aspects.
- To learn the concept of programming.
- To learn C language.

Prerequisites

- Background of the basic science at +2 level

Course Outline

Unit I [12T]

Introduction: The problem solving aspect, Top-down design, Implementation of algorithms, Program verification, efficiency of algorithms. Introduction to C Programming, overview and importance of C, C Program Structure and Simple programs, Creation and Compilation of C Programs under Linux and Windows Platforms.

Unit II [12T]

Elements of C Language and Program constructs, Character Set, C Tokens, Keywords and Identifier, Constants, Variables, Data types, Variable declaration and assignment of values, Symbolic constant definition. C-Operators, Arithmetic operators, relational operators, and logical operators, assignment operators, increment and decrement operators, conditional operators, special operators, arithmetic expressions, evaluation of expressions, precedence of arithmetic operators, Type conversion in expressions, operator precedence and associativity, Mathematical Functions, I/O operations.

Unit III [12T]

Decision making, Branching and Looping, Decision making with IF statement, Simple IF statement, If.. else statement, Nesting of If..else and else...if Ladder, Switch statement, Conditional operator, Go-to statement. Looping: While loop, Do-While, and For Loops, Nesting of loops, jumps in loop, skipping of loops.

Unit IV [12T]

Array & Strings - One dimensional array, two dimensional array and multidimensional array, strings and string manipulation functions. Structures & Union structure definition , giving values to members, structure initialization, comparison of structure variables, arrays of structures, arrays within structures, structures within arrays, structures and functions, Unions, CSC-fields.

References:

1. Balaguruswami, *Programming in ANSI C*
2. Brian W. Kernighan & Dennis M. Ritchie, *The C Programming Language*
3. Yashvant P. Kanetkar, *Let Us C*
4. ByranGotfried, *Programming with C*, Schaums Outline Series

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS)

IRINJALAKUDA BCA - SEMESTER 5

MODEL QUESTION PAPER

SJBCS5D03 – Introduction to Problem Solving and C Programming

TIME: 2 HOURS

MAX: 40 Marks

PART A

Answer all questions.

Each question carries 1 mark.

1. What is an identifier? Give examples
2. What is a register variable?
3. What is the purpose of return() statement?
4. How will you read a string using scanf() function?
5. What is a pointer? How will you access a variable through its pointer?
6. What is a conditional operator? Explain with example.
7. What is a structure?
8. Differentiate between actual and formal parameters with example
9. What is meant by type casting?
10. What is meant by dynamic memory allocation?

(10X1=10 marks)

PART B

Answer all questions

Each question carries 2 marks

11. Describe the switch statement with example
12. What is a function? What are its advantages?
13. Explain the jumping statements in C with examples
14. Which are the file handling functions?
15. Differentiate between call by value and call by reference with suitable examples

(5X2=10 marks)

PART C

*Answer any **five** questions*

Each question carries 4 marks.

16. . Explain with example ,the meaning of statement and block in a „C“ program
17. Write a „C“ program to demonstrate the use of unconditional goto statement
18. Explain with syntax ,if, if-else and nested if-else statements in „C“ program
19. Write a C program to find the biggest of three numbers
20. Implement a C program to find the reverse of an integer number and check whether it is palindrome or not
21. Write a C program to find the transpose of a given matrix
22. Define string. How string is declared and initialized ? Explain string input/output functions with an example
23. Define string. List out all string manipulation function. Explain any two with example

(5X4=20 marks)

Course Code: SJBCS5D04

Name of the Course: - Introduction to Data Analysis Using Spread Sheet

	Course Outcome	Pos/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Students can enhance understanding of content within a graphic presentation of the information	PSO2	U	F	12
CO2	Students will be able to visually representation of data that makes it easier to analyze.	PSO3	Z	F	12
CO3	Student can reduces the difficulty of plotting data and allows students a means for interpreting the data	PSO3	E	C	10
CO4	Students will actually want to outwardly address information to examine and contemplate it without any problem	PSO1	E	F	10
CO5	Students can do and get familiar with the quickest method to do the estimation with exactness.	PSO1	A	P	10
CO6	It helps the students to constructs solid scientific reasoning and abilities	PSO4	C	P	10

R-remember, U-understand, A- apply, Z- analyze, E- evaluate, C- create

***F-factual, C-conceptual, P-practical/procedural**

SJBCS5D04 - Introduction to Data Analysis using Spread sheet

Course Number: 29

Contact Hours per Week: 3T

Number of Credits: 3

Number of Contact Hours: 48 Hrs.

Course Evaluation: Internal – 15 Marks + External – 60 Marks

Objective

- To introduce the importance of software tools.
- To learn the Analysis using Spread sheets.

Prerequisites

- Background of the Basic Science and statistics at +2 level

Course Outline

Unit I [12T]

Introduction to MS Excel and Understanding Basic Working with it: Quick review on MS Excel Options, Ribbon, Sheets, Difference between Excel 2003, 2007, 2010 and 2013- Saving Excel File as PDF, CSV and Older versions - Using Excel Shortcuts - Copy, Cut, Paste, Hide, Unhide, and Link the Data in Rows, Columns and Sheet Using Paste Special Options - Formatting Cells, Rows, Columns and Sheets - Protecting & Unprotecting Cells, Rows, Columns and Sheets with or without Password - Page Layout and Printer Properties - Inserting Pictures and other objects in Worksheets

Unit II [12T]

Introduction to Pivot table: Use multiple pivot tables and pivot charts to create dashboard, Connect multiple slicers to the pivot tables.

Unit III [12T]

Pivot table applications in analytics: filter the data shown in the pivot in different ways to achieve subsets of the data, Use calculated fields on top of the pivot table to calculate profitability and find anomalies.

Unit IV [12T]

Formulae and Function: Use formulas to aggregate the data as an alternative to pivot tables for more flexible reporting layouts. Usage of multiple tables in a single pivot, introduction to datatable.

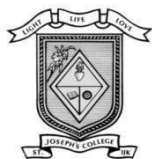
Text Books:

1. Winston, *Microsoft Excel 2013: Data Analysis and Business Modeling*, Prentice Hall India Learning Private Limited (2013), ISBN: 9788120349605

References:

1. John Walkenbach, *Microsoft Excel 2013 Bible*, Wiley (23 April 2013), ISBN: 9788126541720.
2. Paul McFedries, *Excel 2013 Formulas and Function 1st Edition*, Pearson India (2014), ISBN: ISBN: 9789332524026.

MODEL QUESTION PAPER



ST. JOSEPH'S COLLEGE (AUTONOMOUS) IRINJALAKUDA BCA -

SEMESTER 5 MODEL QUESTION PAPER SJBCS5D04 - Introduction to Data Analysis using Spread sheet

TIME: 2 HOURS
Marks

MAX: 40

PART A

*Answer **all** questions.*

Each question carries 1 mark.

11. Define Pivot table
12. Write shortcuts for copy, paste and cut.
13. What is Function in Spreadsheet?
14. How insert pictures in Spreadsheet?
15. How to save an Excel File as PDF
16. What is a cell?
17. What do you mean by cell addressing?
18. How to open a saved excel sheet?
19. How to rename a worksheet?
20. What is ribbon in spreadsheet?

**(10X1=10
marks)**

PART B

*Answer **all** questions*

Each question carries 2 marks

24. How to Connect multiple slicers to the pivot tables.
25. Link the Data in Rows.
26. Explain the use of spreadsheet in business.
27. How to Format Cells in Excel.
28. How to insert rows and columns in a spreadsheet

(5X2=10 marks)

PART C

*Answer any **five** questions*

Each question carries 4 marks.

29. How to insert sheets to a workbook?
30. Explain the need of linking data between workbook
31. Write short note on Pivot table applications in analytics.
32. Explain the Usage of multiple tables in a single pivot.
33. How to do Protecting & Unprotecting Cells in a spreadsheet.
34. How to use pivot charts to create dashboard.
35. Specify the order of operations used for evaluating formulas in Excel.
36. Explain Page Layout and Printer Properties.

(5X4=20 marks)

Course Code: SJBCA6B17**Name of the Course: - Industrial Visit and Project Work**

	Course Outcome	Pos/ PSOs	C L	K C	Class Sessions (appr.)
CO1	Students will discover how does web works really, what makes web sites work.	PSO2	U	F	15
CO2	Students will be able to add lists, styles and themes, linking pages, working with images to an active web page.	PSO2	Z	F	15
CO3	Students are able to develop a dynamic webpage by the use of java script and DHTML.	PSO4	C	P	13
CO4	Students will be able to write a server side java application called JSP to catch form data sent from client and store it on database.	PSO4	E	P	13

SJBCA6B17-Industrial Visit and Project Work

Course Number: 36

Contact Hours per Week: 4 (0T + 2L in V Sem + 2L in VI Sem)

Number of Credits: 2

Number of Contact Hours: 64 Hrs.

Course Evaluation: Internal – 20 Marks + External – 80 Marks

Objective

To provide practical knowledge on software development process

Prerequisites

Basic programming and system development knowledge

Course Outline

The objective of the B.Sc. Computer Science final project work is to develop a quality software solution by following the software engineering principles and practices. During the development of the project the students should involve in all the stages of the software development life cycle (SDLC). The main objective of this project course is to provide learners a platform to demonstrate their practical and theoretical skills gained during five semesters of study in B.Sc. Computer Science Programme.

During project development students are expected to define a project problem, do requirements analysis, systems design, software development, apply testing strategies and do documentation with an overall emphasis on the development of a robust, efficient and reliable software systems. The project development process has to be consistent and should follow standard. For example database tables designed in the system should match with the E-R Diagram. SRS documents to be created as per IEEE standards.

Students are encouraged to work on a project preferably on a live software project sponsored by industry or any research organization. Topics selected should be complex and large enough to justify as a B.Sc. Computer Science final semester project. The courses studied by the students during the B.Sc. Computer Science

Programme provide them the comprehensive background knowledge on diverse subject areas in computer science such as computer programming, data structure, DBMS, Computer Organization, Software Engineering, Computer Networks, etc., which will be helping students in doing project work. Students can also undertake group project to learn how to work in groups. However, the maximum number of students in a group must be limited to 4.

For internal evaluation, the progress of the student shall be systematically assessed through *two or three stages of evaluation at periodic intervals*.

A bonafied project report shall be submitted in hard bound complete in all aspects.

Industrial Visit:

Contact Hours per Week: NIL

Number of Credits: 1

Number of Contact Hours: NIL

Course Evaluation: External – 10 Marks

Guide Lines:

- Minimum one day visit to National research Institutes, Laboratories, places of scientific Importance or Software Companies.

OR

- One week Industrial Training / internship at any software firms/ Research Labs
- The Industrial visit should be done in fifth or sixth semester.
- A 10 – 20 page Industrial visit / Training report have to be submitted with certificate from industry / institute, sufficient photos and analysis along with Project for evaluation in the sixth semester.

Certification Courses					
Semester	Course Code	Course Name	Credit	Hrs/wk	
				L	T
Semester I	SJBCA1CC01	Operating System	Non credit	3	3
Semester II	SJBCA2CC01	Computer Networks	Non credit	4	4
Semester III	SJBCA3CC01	Introduction to Digital technology	Non credit	3	3
Semester IV	SJBCA4CC01	Virtualization and Cloud	Non credit	4	4
Semester V	SJBCA5CC01	Process Management	Non credit	3	3
Semester V	SJBCA5CC02	Infrastructure Management	Non credit	3	3
Semester VI	SJBCA6CC01	Client relationship Management and ITIL	Non Credit	3	3
Semester VI	SJBCA6CC02	Introduction to Worksheet	Non Credit	2	2
Total				25	25

SJBCA1CC01 – OPERATING SYSTEMS

Contact Hours per Week: 4

Number of Credits: 0

Number of Contact Hours: 48 Hrs.

Objectives

- To learn operating systems

Prerequisites

- Basic Computer fundamentals

Course Outline

Unit I

Windows-Hardware Basics, Operating System overview and Windows, Windows 7 Essential, Client OS-Windows 7-Users and Groups-IP Configuration, Client OS-Windows 7 Tools and Utilities-Client OS Windows 7- Installation-Features-Disk Management-File Systems.

Unit II

Server OS-Windows Server 2012 Overview-Server DNS-Zone Creation - DHCP LAB-Advanced server storage Management-server ADS concepts and FSMO-Server OS Windows Server 2012 Roles and features- Server OS Windows Server 2012 File and Print Services.

Unit III

Server OS monitoring and managing Windows Server 2012-Server OS Windows Server 2012 DNS and DHCP- Server OS Windows server 2012 Administrative Tools and ADS

Unit IV

Server OS-Windows Server 2012-Storage and Backup Management-Client OS Windows 7 Devices and Printers-Server OS Windows Server 2012 Installation.

Unit V

Group Policy Management-Server Windows Server 2012- File and print services-Group Policy-Server Storage Management –Server Scenario- Server OS Windows Server 2012-DNS and DHCP - Server- ADS scenario.

Reference Books

1. Mitch Tulloch, “Windows 7 Essential Guidance”, 2009.
2. William PanekTylor Wentworth, “Microsoft Windows 7 Administration”, Wiley Publishing, 2010
3. Charles Edge, Chris Barker EhrenSchwiebert, “Beginning MacOSX Snow Leopard Server”, 2010
4. Greg Tomsho, “Guide to Operating System”, 5th Edition, 2017.

OPERATING SYSTEM LAB

Exercises

- Installation of client and server OS
- Create server and play roles
- Zone creation and DHCP
- File and print services
- Devices and printers
- Group policy
- Server storage management
- Server scenario
- ADS Scenario based
- DNS and DHCP

SJBCA2CC01- Computer Networks

Contact Hours per Week: 4

Number of Credits: 0

Number of Contact Hours: 64Hrs.

Objective

- To learn about transmissions in Computer Networks.
- To learn various Protocols used in Communication.
- To have a general idea on Network Administration.

Prerequisites

- Basic Computer fundamentals

Course Outline

Unit I

Introduction - Applications – LAN – WAN – MAN - Network Hardware - Network Software: Protocol Hierarchies – Connection-oriented and connectionless services. Reference Models: OSI Reference Model – TCP/IP Reference Model – Comparison of OSI and TCP/IP.

Unit II

Basics - Protocols, Topology - Guided Transmission Media: Magnetic Media – Twisted Pair – Coaxial Cable – Fiber Optics. Wireless Transmission: Electromagnetic Spectrum – Radio Transmission – Microwave Transmission – Communication Satellites: Geostationary, Medium-Earth Orbit, Low Earth-orbit Satellites.

Network

Unit III

IP Addressing Version 4 – IP Addressing Version 6 – Subnetting Advanced VLSM - Switch Basic - VLAN - VTP / CDP - Subnetting Basic Version 4 - Network Quiz - Routing Static

Unit IV

Routing algorithms – Congestion Control Algorithms - CISCO IOS / Managing / Password recovery - Routing Dynamic Routing protocols OSPF RIP EIGRP - Network Advanced Routing Dynamic Routing protocols - OSPF RIP EIGRP

Unit V

Monitoring Network Devices - Overview of ACL\NAT\WAN\Wireless

Reference Books

1. David J.Wetherall, Andrew S.Tanenbaum, "Computer Networks", 5th Edition, Pearson Education, 2012.
2. Behrouz A. Forouzan, "Data Communication and Networking", 4th Edition, Tata McGraw Hill, 2007.
3. SilviuAngelescu, "CCNA Certification All-In-One for Dummies", Wiley Publishing. Inc.

COMPUTER NETWORKS LAB

Requirements:

Cisco packet tracer software (Freeware)

Exercises

- Switch basic VLAN
- Routing Static
- Switch basic commands
- Switch basic STP
- Dynamic Routing protocols OSPF RIP EIGRP

SJBCA3CC01 –Introduction to Digital Technology

Contact Hours per Week: 3

Number of Credits: 0

Number of Contact Hours: 48 Hrs.

Objective

- To get a general introduction to the digital technology

Prerequisites

- Basic knowledge in computer networks and operating systems

Course Outline

Unit I

Digital Primer - Why is Digital Different?- Digital Metaphors On Cloud 9-A Small Intro to Big Data-Social Media & Digital Marketing-Artificial Intelligence- Unchain the Block chain-Internet of Everything-Immersive Technology.

Unit II

Digital for Industries-Manufacturing and Hi-tech-Banking and Financial Services-Insurance and Healthcare-Retail-Travel & Hospitality-Communications, Media & Information Services-Government.

Unit III

Automatix – Art of RPA-Introduction - Setting the Context-RPA Prelude-RPA Demystified-RPA vs BPM RPA Implementations-RPA in Industries-RPA Tools-Automatix - Art of RPA

Unit IV

Automation Anywhere-Getting Started with AA Enterprise-Exploring AA Enterprise-AA Enterprise – Architecture.

Unit V

Knowing the Bots-More About TaskBots-AA Enterprise - All About Recorders-Designers-MetaBots-Cognitive RPA.

Reference Books

1. Richard Murdoch, “Robotic Process Automation: Guide To Building Software Robots, Automate Repetitive Tasks & Become an RPA Consultant”
2. Kelly Wibbenmeyer, “The Simple Implementation Guide to Robotic Process Automation (RPA): How to Best Implement RPA in an Organization”

DIGITAL TECHNOLOGYLAB

Exercises

- Creating bots for automatic software installation
- Creating bots for automatic software patch installation
- Creating bots for file transfer
- Creating bots for automatic file backup

SJBCA4CC01- VIRTUALIZATION AND CLOUD

Contact Hours per Week: 3

Number of Credits: 0

Number of Contact Hours: 80 Hrs.

Objective

- To learn the basics of virtualization and cloud

Prerequisites

- Basic knowledge in operating systems and networks

Course Outline

Unit I

Distributed Systems: Distribute a system - Distributed algorithm - Distributed Data Stores - Distributed Computing - File Systems - Distributed Messaging - Distributed Applications – Distributed Transaction - Parallel and distributed computing - Applications.

Unit II

Cloud Concepts: Introduction Cloud Computing - Advantages of Cloud - Public Cloud - five essential characteristics - three service models - Four deployment models - Benefits of Cloud Computing - Cloud Vendors - Traditional Infrastructure setup and Challenges – AWS.

Unit III

Virtualization : Introduction to vSphere and the Software - Defined Data Center Creating Virtual Machines - VCenter Server - Configuring and Managing - Virtual Networks Configuring and Managing Virtual Storage - Virtual Machine Management - Resource Management and Monitoring.

Unit IV

Virtual Machines: vSphere HA - vSphere Fault Tolerance - Protecting Data vSphere DRS - Network Scalability - vSphere Update Manager and Host Maintenance - Storage Scalability - Securing Virtual Machines.

Unit V

Datacenter: Data center overview -Components - Provisions - Need of Data Center - Data Center Architecture - Different Racks - Data center architecture for cloud computing - role of data center in cloud computing.

Reference Books

1. Jean Dollimore formerly of Queen Mary, Tim Kindberg, “Distributed Systems Concepts and Design”, 5th Edition Cambridge University, University of London
2. VenkataJosyula , Malcolm Orr , Greg Page, “Cloud Computing: Automating the Virtualized Data Center”, 1st Edition.
3. Brian J.S. Chee, Curtis Franklin Jr., “Cloud Computing: Technologies and Strategies of the Ubiquitous Data Center”, 1st Edition.

VIRTUALIZATION AND CLOUD LAB

Exercises

- Working with hypervisors
- Creating account in AWS
- Exploring AWS services like storage, machine image, pricing models, data bases

SJBCA5CC01- Process Management

Contact Hours per Week: 3

Number of Credits: 0

Number of Contact Hours: 80 Hrs.

Objective

- To learn the basics of Software and software process management

Prerequisites

- Basic knowledge in Computer Fundamentals

Course Outline

Unit I

Software and software Engineering: The Nature of Software –The Unique Nature of WebApps- Software Engineering- Software Process-Software Engineering Practice-Software Myths. Software Process Model: A Generic Process Model- Process Assessment and Improvement –Perspective Process Models-Specialized Process Model-The Unified Process.

Unit II

Agile: Agile Methodology-Manifesto-Principles of Agile-Agile Methodologies-Challenges with Agile. Scrum: Overview of Scrum-Scrum Roles-Scrum Ceremonies-Scrum Artifacts-Extreme programming vs Scrum.

Unit III

Devops: Introduction to Devops-Principles-Automation-Performance Measurement through KPIS and Metrics-Agile and Devops-Agile Infrastructure-Velocity-Lean Startup UPS.

Unit IV

Lean UX and Agile Anti-Patterns : Sprint -Staggered sprints -Sprint zero and design sprints- Dual-track Agile- Listening to Scrum's rhythms- Listening to Scrum's rhythms- Participation- Design is a team sport- Coordinating multiple Lean UX teams- Managing up and out – Agile anti-patterns.

Unit V

Design Thinking: Introduction to Design Thinking – Lean thinking - Actionable Strategy- The Problem with Complexity - Vision and Strategy - Defining Actionable Strategy Act to Learn - Leading Teams to Win.

Reference Books

1. Roger S Pressman, “Software Engineering A Practitioners Approach”, 7th Edition 2010
2. Kallori Vikraman, “Introduction to Devops”, 1st Edition, 2016.
3. Stephen Haunts, “Essential of Scrum” Addison-Wesley Professional; 1st Edition, 2012
4. Jeff Gothelf, Josh Seiden, “Lean UX”, 2nd Edition, 2016.
5. Jonny Schneider, “Understanding Design Thinking, Lean, and Agile” O’Reilly Media 2017.
6. Jeff Gothelf, “Lean vs. Agile vs. Design Thinking” Sense and Respond Press, 2017.

SJBCA5CC02- INFRASTRUCTURE MANAGEMENT

Contact Hours per Week: 3

Number of Credits: 0

Number of Contact Hours: 80 Hrs.

Objective

- To learn the basics of infrastructure management in frames

Prerequisites

- Basic knowledge in operating systems

Course Outline

Unit I -Introducing Windows 10: Overview of Deploying Windows 10- Configure Devices and Drivers- Perform Post installation Configuration Task- Managing Apps in Window.

Unit II -MS SCCM Basics- Overview of System Center 2012 R2 Configuration Manager-Planning and Deploying a Stand-Alone Primary Site- Planning and Configuring Role-Based Administration- Planning and Deploying a Multiple-Site Hierarchy- Replicating Data and Managing Content in Configuration Manager 2012-Planning Resource Discovery and Client Deployment- Configuring Internet and Cloud-Based Client Management- Maintaining and Monitoring System Center 2012 Configuration Manager.

Unit III -Overview of System Center 2012 R2 Operations Manager: Operations Manager Introduction and Basic Concepts- Reason to use Operations Manager- What’s New in 2012 R2 Operations Manager- System Requirements- Operations Manager Components. Planning & Installation: Deployment Scenarios-Order of Installation- Installation Process- SQL Server Configuration- Operations Console- Web Console.

Unit IV -Administration : Agent Deployment- Security of manual agent- Agent and Agent less managed systems-Role Based Security- Reporting server- Object Discovery. Management Packs: Management Pack Overview- Pre-Installed Management Packs- Importing Management Packs- Overrides.

Unit V -Monitoring Overview- Overriding of MPs- Creating Rules and Monitors- Agentless Monitoring- Demo on Role Based Security- Creating Groups- Configuring Notifications. Operations Manager Reporting: Installing SQL Reporting Services- Installing Operations Manager Reporting- Creating, Viewing and Customizing Reports- Dashboard- Considerations for High Availability and Disaster Recovery.

Reference Books

1. Kerrie Meyler, Gerry Hampson, “System Center Configuration Manager Current Branch Unleashed System” 1st Edition, 2018.
2. SlawekLigus, “Effective Monitoring and Alerting: For Web Operations” 1st Edition, 2012.

INFRASTRUCTURE MANAGEMENT LAB

Exercises

- Working with SCCM
- Working with SCOM

SJBCA6CC01- CLIENT RELATIONSHIP MANAGEMENT

Contact Hours per Week: 4

Number of Credits: 0

Number of Contact Hours: 64Hrs.

Objective

- To learn the basics of manage client relationship

Prerequisites

- Basic knowledge in company infrastructure

Course Outline

Unit I

Service Now Intermediate level / Administrator-ServiceNow Introduction-ServiceNow Platform UI ServiceNow ITSM overview-Managing Users, Groups and Roles, departments, companies and Assignment Rules-Tables, Columns,Attributes,Dictionary Entries ,Schema Map-Managing Forms , Layouts and Lists-Dictionary Overrides and Simple Reference Qualifiers.

Unit II

System Properties - Incident management - Problem management- Change management- Overview of other ITSM Modules - Overview of other ITSM Modules- SLA Basics-Introduction to Client and Server Side Scripting-server-side scripting - Server Side Glide API -server-side scripting - Server Side Glide API -Server Side script Debugging-Server Side Scripting Best Practices-Business Rules-Client Side APIs-UI Policies and Data Policies-Client Scripts -Client Side script Debugging.

Unit III

Client Scripts & Client Glide APIs-Best Practices - client-side scripting & policies (UI and Data)- Modularize programming using UI Actions (both Server and Client Side)-Script Include-Glide AJAX-UI Pages and UI Macros-Managing Update Sets-Custom Applications Automated Test Framework –Events-Inbound/Out Bound notifications-Mail Templates and Scripts.

Unit IV

Manage Workflows-Managing Stage Sets -Manage Workflows -Manage Workflows -Flow Designer (Over view)-Service Catalogs, Categories, Items and variables-Manage Execution Plans and workflows-Card Layouts-Client scripts and UI policies-Record Producers-Order Guides & Scriptable Order Guides-Scheduled Jobs. VTB Agent Intelligence (Over View)-Restrict access to applications and application modules-Automatically create application Access Controls -Manually create, test, and debug Access Controls-Managing ServiceNow imports and exports-Managing Import Sets and Transform Map-Configure and run Reports and Dashboards Security Controls-Database Views.

Unit V

ServiceNow Service portals overview -ServiceNow Service portals core components -Scripting in Service Portal-ITSM Virtual Agent – Overview-Performance Analytics Overview-ServiceNow on Mobile-ServiceNow Integration Overview.

Reference Books

1. Tim Woodruff, “Learning ServiceNow: Administration and development on the Now platform, for powerful IT automation”, 2nd Edition, Packt Publishing Ltd., 2018.
2. Ashish Rudra Srivastava “ServiceNow Cook Book” Packt Publishing Ltd, 2017.
3. Andrew Kindred , “Mastering ServiceNow Scripting” Packt Publishing2018.

CLIENT RELATIONSHIP MANAGEMENT LAB

Exercises

- Creating tickets for servicing requests from clients
- Creating reports of status of client services

SJBCA6CC02- PROBLEM SOLVING USING WORKSHEETS LAB

Contact Hours per Week: 4

Number of Credits: 0

Number of Contact Hours: 64Hrs.

Objective

- Develop intra-personal, inter-personal, critical thinking, decision making and communication skills.
- Establish self-management and help to maintain work life balance.
- Get an insight to career planning and development

Prerequisites

- Basic knowledge in excel

Course Outline

Exercises:

- Create sales dashboard (such as Market wise, Product wise, quarter wise sales) in Excel using VBA code
- Create randomized quiz question paper in Excel using VBA code.
- Design an attendance tracker using login time of the employee in Excel using VBA code to perform the operation like if employee is late, and then lock the system.