

Total No. of Questions : 7]

SEAT No. :

PC-3207

[Total No. of Pages : 2

[6383]-11

M.C.A. (Management Faculty)

IT - 11 : PROBLEM SOLVING USING C++

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *Figures to the right side indicate full marks.*

- Q1)** a) Write a pseudo code for to check number is perfect number, Example 6 perfect number addition of factors is same as number (3*2*1) (3+2+1).[5]
b) Explain Analysis of Algorithms. [5]

- Q2)** a) Explain function with default arguments with example. [5]
b) Write a program to swap two numbers using call by reference. [5]

OR

- a) What is virtual function explain with example.
- b) Write a function to demonstrate return by reference.

- Q3)** a) Write a program of overload + operator to add two fraction numbers.[7]
b) Which operators are overloaded using friend function. [3]

OR

- a) Define class box and overload < operator for comparing two boxes on the basis of volume.
- b) What is static member?

P.T.O.

- Q4)** a) Explain Constructor in Derived Classes with example. [7]
b) What is destructor in C++? [3]

OR

- a) Explain virtual class with example.
b) Explain Class in C++.

- Q5)** a) Explain abstract classes with example. [7]
b) Explain arithmetic Operators in C++. [3]

OR

- a) Explain constructor overloading in C++ with example.
b) What is type casting in C++?

- Q6)** a) Explain Hierarchical inheritance C++. [7]
b) Explain delete operator. [3]

OR

- a) What is static function? Explain with example.
b) Explain use of while and for statement.

- Q7)** a) Write program for Tower of Hanoi. [7]
b) What are unary operators in C++? [3]

OR

- a) Write a program for Mouse in Maze problem.
b) What Scope Resolution Operator in C++?



Total No. of Questions : 8]

SEAT No. :

PC-3208

[Total No. of Pages : 2

[6383]-12

M.C.A. (Management)

IT - 12 : SOFTWARE ENGINEERING USING UML

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *Q.1 & Q.7 are compulsory.*
- 2) *Solve any four of the remaining questions.*
- 3) *Draw neat & labelled diagram wherever necessary.*

Q1) CruiseVoyage aims to launch an online booking system for cruise reservations. Customers will be able to select cruise packages, choose cabin preferences and make payments via credit cards, debit cards, or digital wallets. The system will offer users the option to cancel reservations and request refunds according to the company's cancellation policy. Additionally, users can log into their accounts to view booking history, track upcoming trips and receive notifications about special offers. Prepare the Software Requirements Specification (SRS) document in IEEE format for the CruiseVoyage Online Booking System. **[20]**

Q2) Draw an activity diagram for booking and delivering flowers through an online florist service. The process includes selecting flower arrangements, entering delivery information, personalizing the order with messages or additional items, making an online payment and confirming the delivery to the recipient. **[10]**

Q3) Global Investment Bank offers Fixed Deposit (FD) schemes specifically for senior citizens, with higher interest rates and longer tenures. Senior citizens can choose the tenure, opt for periodic interest payouts and have the option to renew or close the FD at maturity. The scheme also allows partial withdrawals with certain conditions. Create a use case diagram showing the key functions available in the FD scheme offered by Global investment Bank.

[10]

P.T.O.

- Q4)** Draw a sequence diagram for booking a ticket to a live event (concert, theatre, or sports event) through an online ticketing system. The user logs into their account, selects the event and desired seats and confirms the booking. The system processes the payment, updates the seating availability and provides a booking confirmation to the user, including the ticket details. **[10]**
- Q5)** Riverbank Community Services is developing a web app for citizens to report illegal dumping and waste disposal violations. Design a complaint form that captures the violation type, location, time and allows photo uploads, along with citizen contact details for follow-up. **[10]**
- Q6)** Design a class diagram for a Furniture Rental System. Customers can browse through available furniture items, add selected items to their rental cart, and proceed to checkout once they have chosen the furniture they wish to rent. The system handles the rental order and tracks the return status. **[10]**
- Q7)** Describe Spiral model with a neat diagram. **[10]**
- Q8)** Write a short note on : (Any two) **[10]**
- a) Phases of SDLC
 - b) State Transition Diagram
 - c) Agile process



Total No. of Questions : 7]

SEAT No. :

PC3209

[6383]-13

[Total No. of Pages : 2

First Year M.C.A. (Management)

IT 13 : DATABASE MANAGEMENT SYSTEM

(2019 Pattern) (Semester-I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Question no.1 is compulsory.
- 2) Solve any 5 questions from remaining.

Q1) A small accounting firm wants a simple HR application that will help it to keep track of its employees, their positions, allowances, salary scales, and which company vehicles their employee's drive.

The application must keep track of all the positions at the firm. the employees filling these positions, the allowances for these positions, the salary scales for these positions, and the company vehicles assigned to these positions. Construct the ERD and normalize the database upto 3 NF. [20]

Q2) Explain various Advantage & Disadvantages of DBMS. [10]

Q3) Describe the structure of XML give suitable example [10]

Q4) Consider the following transactions. Give two non-serial schedules that are serializable. [10]

T1	T2
Read (A)	Read (A)
A = A + 500	A = A – 500
Write (A)	Write (A) Read (B)
Read (C)	B = B – 500
C = C – 500	Write (B)
Write (C)	Read (B)
	B =B + 500
	Write (B)

P.T.O.

- Q5)** a) Explain in Log base recovery with suitable example. [10]
b) Explain the Locking techniques with suitable example.

Q6) Discuss Remote backup system. [10]

Q7) Write a short note (any 2) [10]

- a) Relational model.
- b) Structure of XML Data
- c) NoSQL database



Total No. of Questions : 7]

SEAT No. :

PC4809

[Total No. of Pages : 2

[6383]-14R

First Year M.C.A. (Management)

IT-14 : ESSENTIALS OF OPERATING SYSTEM

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 & Q.7 are compulsory.
- 2) Solve any four questions from Q.2 to Q.6.
- 3) Draw neat diagram wherever necessary.

Q1) a) Consider the following processes, apply SJF pre-emptive scheduling. Draw Gantt chart and calculate average waiting time and turnaround time. **[15]**

Process	Burst Time	Arrival Time
P1	6	2
P2	2	5
P3	8	1
P4	3	0
P5	4	4

b) Describe deadlock in detail. **[5]**

Q2) State and explain distributed OS and its design issues **[10]**

OR

What is multiprocessor OS? Explain its design issues

Q3) Consider following page reference string in order as given below; consider a main memory with the capacity of 4-page frames. **[10]**

1,3,4,4,3,2,1,7,5,6,4,2,1,2

Which of FIFO or LRU would be better in this case as page replacement policy?

P.T.O.

Q4) What is Linux? Explain Linux distribution in detail. **[10]**

OR

Define Linux shell. Also explain process management in Linux.

Q5) What is bash shell? Explain shell variables in detail. **[10]**

OR

Explain user management in Linux.

Q6) Explain mobile operating system with architecture. **[10]**

OR

Explain mobile operating system with various examples.

Q7) Write short notes on: (Any 2) **[10]**

- a) Paging
- b) Segmentation
- c) Virtual Memory



Total No. of Questions : 8]

SEAT No. :

PC-3211

[Total No. of Pages : 2

[6383]-15

M.C.A. (Management)

BM-11 : Business Process Domain

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *Q.1 and Q.8 are Compulsory.*
- 2) *Attempt any four from remaining.*
- 3) *Use of simple calculator is allowed.*

Q1) Shivam Agrochemical Pvt. Ltd is one of the growing agro-chemical manufacturing organizations situated at Pune. They want to open its branches all over India for providing better service to their customers. As a Marketing manager you have been asked to-

- a) Suggest different parameters to be considered before starting branch and marketing. **[10]**
- b) Suggest your views to create different basis of market segmentation. **[10]**

Q2) a) Mr. Sharma's Basic Salary = Rs. 50,000. DA= 145%, He has completed 20 years of no. of service. Calculate eligible gratuity amount for him.**[5]**

- b) Mr. A is getting basic pay = Rs. 40,000, DA= 140%, HRA=20%, Rs. TA=8000. Per month deductions from his salary are PF=Rs. 1380, LIC =Rs.700, PT=Rs. 200, Joining year of service is 2015. Prepare a salary slip and calculate eligible Gratuity amount. **[5]**

Q3) Discuss with suitable example different Business models of e-commerce? **[10]**

OR

Elaborate different Electronic payment systems used in modern businesses.

[10]

P.T.O.

- Q4)** a) What are the pros and cons of insourcing and outsourcing. [10]
b) Explain any one Inventory control technique.

OR

Describe different modes of transportation? [10]

Q5) What is CRM? Explain CRM Implementation strategies with suitable example. [10]

Q6) Shivraj Travels is one of the renowned Tour and Travels management company, wants to bind his customers for long term business gain. You have been asked to suggest CRM life cycle with reference to Shivraj Travels. [10]

Q7) What is Loans? Discuss various types of loans. Also discuss Loan Sanction Process. [10]

OR

What is need of Insurance? Discuss different types of insurance. Also discuss Insurance processes in short. [10]

Q8) Write short note on any Two [2 × 5 = 10]

- a) Leave Types.
- b) Supply Chain Management.
- c) Types of accounts.



Total No. of Questions : 7]

SEAT No. :

PC-3212

[Total No. of Pages : 2

[6383]-21
M.C.A. (MANAGEMENT)
IT - 21 : Data Structure and Algorithm
(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) Explain Quick sort algorithm & sort the following element using quick sort. **[10]**

55,90,85,99,95,70,68,57,10,23.

Q2) a) Convert the given infix expression to prefix form. Show the contents of stack at each step. **[10]**

$B * (A + C - D) / E * F / G.$

OR

b) Explain stack operations. Evaluate the following postfix expression.

$AB - C * DEF + \$ 1$

Where,

$A=3, B = 4, C = 1, D = -1, E = 6, F = 5.$

Show the content of stack at each step in tabular form.

Q3) a) Write an algorithm for priority Queue. **[10]**

OR

b) Write an algorithm to reverse the content of stack using queue. **[10]**

Q4) a) Write an algorithm to merge two sorted linked list. **[10]**

OR

b) Write an algorithm to delete a node in doubly linked list. **[10]**

P.T.O.

Q5) a) Draw a Binary search tree for **[5]**
23, 89, 34, 67, 99, 2, 55, 45, 78, 12, 56

Write preorder & postorder traversal for the tree.

b) Write an algorithm for non-recursive Inorder traversal. **[5]**

OR

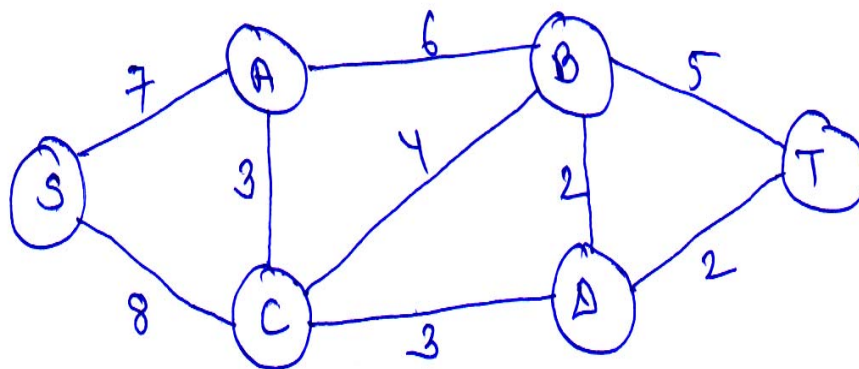
c) Construct AVL tree for the following : **[10]**

Milu, Pranita, Princes, Raju, Joni, John, Akshay, Pavan, Oddy, Umesh.

Q6) a) What is MST? Write PRIM's algorithm for MST. **[10]**

OR

b) Apply Kruskal's algorithm to obtain minimum cost spanning tree for following graph. **[10]**



Q7) Write short note on (Any Two) : **[10]**

- a) Merge sort
- b) Threaded Binary Tree
- c) Dijkstra's Algorithm



Total No. of Questions : 7]

SEAT No. :

PC-3213

[Total No. of Pages : 2

[6383]-22
F.Y.M.C.A.
MANAGEMENT
IT - 22 : Web Technologies
(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) Design a form to Accept UID information from Indian Citizens and validate any five different fields with different criteria using Java script. **[10]**

Q2) a) Explain the features of HTML 5 over HTML 4 with suitable examples.**[10]**

OR

b) Explain SVG and canvas tag with example.

Q3) a) Explain different types of CSS with suitable example of each type of CSS. **[10]**

OR

b) Implement the given CSS style in any HTML page.

- i) Paragraph with background
- ii) Font with color green
- iii) Table with odd & Even different color
- iv) Rotation of Div pannel
- v) Page with fixed background

Q4) a) Explain the Animation effects of JQuery with example. **[10]**

OR

b) Explain the JQuery events with attributes with example.

P.T.O.

Q5) a) Explain Array in Java script with suitable example. **[10]**

OR

b) Explain different types of loops in Java script with suitable example.

Q6) a) Write a PHP code for online Gas Booking system. Store the information in suitable database. **[10]**

OR

b) Explain with examples : super Global variables in PHP.

Q7) Write short notes on (Any Two) : **[10]**

- a) Video tag
- b) CSS3- Rotation
- c) Math object in JS
- d) Array in PHP
- e) JQuery selectors



Total No. of Questions : 7]

SEAT No. :

PC3214

[6383]-23

[Total No. of Pages : 2

First Year M.C.A. (Management)
IT-23 : ESSENTIALS OF NETWORKING
(2019 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 & Q.7 are compulsory.
- 2) Solve any four questions from Q.2 to Q.6.
- 3) Figures to the right indicate full marks.
- 4) Draw neat diagram wherever necessary.

Q1) a) What is SMTP? Explain the functioning of SMTP in detail. [10]

b) For the given class C, 192.168.127.1 and subnet mask 255.255.255.224 calculate: [5]

- i) Total Number of Subnets
- ii) Total Number of Host IP per subnet
- iii) First and Last subnet address.

OR

b) Define the subnet mask to be used in Class B addressing to support 30 subnets and also find the number of hosts possible in each subnet. [5]

Q2) Describe the TCP/IP reference model in detail. [10]

Q3) What are Resource Records? Explain different types of Resource Records in detail. [10]

Q4) What is cryptography? Explain symmetric and asymmetric methods with an example. [10]

Q5) What is the concepts of IP routing? Explain EIGRP routing protocol. [10]

P.T.O.

Q6) Generate CRC code for the data word 1010101011 using the divisor 10001.[10]

OR

Generate a Hamming code with binary value 10101001110 using an odd parity.
[10]

Q7) Write short notes (Any 3) [15]

- a) Ethernet
- b) Communication Devices
- c) P2P protocol
- d) TCP connections
- e) DNS caching



Total No. of Questions : 5]

SEAT No. :

PC3215

[6383]-24

[Total No. of Pages :4

First Year M.C.A. (Management)

MT-21 : BUSINESS STATISTICS

(2019 Pattern) (Semester- II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Use of Non-programmable Calculator is allowed & Statistical tables are allowed.
- 3) Figures to the right indicate full marks.
- 4) Solve (a, b) or (c, d) of each questions.

- Q1) a) Explain any 2 Chi-square test used in testing of hypothesis. [7]
- b) The score of two batsman is given below. Find which batsman is more consistent in bating. [7]

Score by batsman A	40	65	90	85	75	35	90	76
Score by batsman B	45	58	82	65	70	64	85	50

OR

- c) Explain the following terms with illustrations. [7]
- i) Power of the test
 - ii) Statistic & Parameter
 - iii) Type I Error
- d) Find Q1, Median 2 Mode for [7]

Class limits	0-10	10-20	20-30	30-40	40-50	50-60
Frequency	7	16	25	20	13	9

- Q2) a) Find coefficent of variation for the following data. [7]

Marks	5	8	10	12	14	15	17
Number of students	3	7	11	15	13	8	2

- b) Find Mean & Mode for the following data of life of particular brand of T.V. sets. [7]

Life in years	0-2	2-4	4-6	6-8	8-10	10-12
No. of sets	5	16	13	10	7	4

OR

P.T.O.

- c) What is the meaning of Measures of central tendency. Explain various measures of central tendency. [7]
- d) Find Outline deviation for the following data of Income. [7]

Income	less than 50	50-70	70-90	90-110	110-130	Above 130
No. of Persons	54	100	140	230	125	51

- Q3)** a) A survey of women was conducted & study of family life & education was taken into consideration check whether educated womens are happy. [7]

	Happy life	Not happy life
Educated	70	25
Not Educated	35	65

- b) The research scholar was interested in relationship between the placement of students from a department. The CGPA of placed students are as follows. [7]

	CGPA				
	Below 6	6-7	7-8	8-9	9-10
No. of students	8	12	17	35	28

OR

- c) Check whether average marks of two divisions are equal using t test Marks in [7]

Div A	91	97	69	51	47	67	70
Div B	81	75	85	39	57	74	75

- d) The weight of womens were noted before & after joining the gym. The weights are as follows. Check whether the weight is reduced after joining the gym. [7]

Weight before joining	60	63	70	60	75	74
Weight after 6 months joining	58	61	59	62	69	70

Q4) a) Construct index numbers of the following data by Fishers method. [7]

Commodity	Base Year		Current Year	
	Price	Value	Price	Value
A	3	18	7	10
B	5	35	10	100
C	6	42	11	55
D	4	32	6	60
E	8	24	9	36

b) Find the Laspeyer's and Paasche's price index for the data given below: [7]

Item	Base Year		Current Year	
	Price	Quantity	Price	Quantity
A	32	7	41	5
B	67	26	82	30
C	134	14	156	15
D	68	20	114	16

OR

c) From the following data find the lines of regression x on y . [7]

x	2	4	6	8	10
y	2	3	4	5	6

d) From the following data, find correlation between [7]

Sales	91	97	108	67	51	73	57
Profit (Rs.)	71	75	69	70	39	61	47

Q5) a) Explain the importance of time series and different components of time series. **[7]**

b)

Year	2001	2002	2003	2004	2005	2006	2007
Production of wheat (in tons)	464	515	518	647	502	540	557

Above data is consisting of production of wheat for various years fit a straight line by the method of least squares and find the trend values.**[7]**

OR

c) Below are given the figures of production (in thousand tons) for sugar factory. Find the trend using 4 years moving average. **[7]**

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Production	77	88	94	85	91	98	90	100	97	102

d) Define the following terms with illustration **[7]**

- i) Level of significance
- ii) Degree of freedom
- iii) Type II Error



Total No. of Questions : 5]

SEAT No. :

PC-3216

[Total No. of Pages : 2

[6383]-25

M.C.A. (Management)

**BM - 21 : PRINCIPLES AND PRACTICES OF
MANAGEMENT AND ORGANIZATIONAL BEHAVIOR
(2019 Pattern) (Semester - II)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) *Draw neat Diagram wherever necessary.*
- 2) *All questions carries equal marks.*

- Q1)** a) Define Management and explain the various types of managerial skills.[5]
b) Discuss Administrative Management by Fayol in detail with example.[5]
OR
a) What are the managerial functions? Explain the process of management with diagram.
b) Compare Scientific Management by Taylor and Administrative Management by Foyle with suitable example in detail.
- Q2)** a) What are the various types of decision making? [5]
b) Apply decision making process for natural disasters and farming sectors. How the risks can be resolved? [5]
OR
a) Describe the types of corporate culture in detail.
b) What is individual decision making and group decision making explain it with example?
- Q3)** a) What are the Levels of Organizational Culture? [10]
b) As a Project Leader in one of the reputed MNC IT company what are the different leadership styles your requires discuss it in detail. [10]
OR
a) Discuss how an individual person can be turning as team player with example.
b) How Theory X and Y, Theory Z is useful in any organization describe it in detail with example?

P.T.O.

- Q4)** a) What is the team building discuss the various types of teams? [5]
b) Analyse the Herzberg's Motivation- Hygiene Theory in hospitals jobs.[5]

OR

- a) What is conflict manages describe the five stages of conflict management?
b) How Yoga plays important role in stress management describe it in detail?

- Q5)** a) What is Personality Theory describe four Personality Theories with example? [10]
b) Being a team member you are having conflicts among the team how you as an individual can resolve the conflicts? [10]

OR

- a) What is stress discuss its types and sources with example?
b) How Johari window is useful explain it with example?



Total No. of Questions : 7]

SEAT No. :

PC3217

[Total No. of Pages : 2

[6383]-31

S.Y.M.C.A. (Management)
IT 31 : JAVA PROGRAMMING
(2019 Pattern) (Symester-III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Draw neat diagram whenever necessary.*

Q1) Answer in short (any five)

[10]

- a) What is an Interface in Java?
- b) Define Abstraction in Java?
- c) What is package in Java?
- d) What are listeners in Java?
- e) Explain Super keyword?
- f) What is Exception handling in Java?

Q2) Write Jdbc application to accept registration details of students in participation of dandiya event (Assume suitable table structre)

[10]

OR

Explain Array in Java with example.

Q3) What is thread lifecycle explain with suitable diagram.

[10]

OR

Explain list in Java with example.

P.T.O.

Q4) Create GUI in Java with AWT or swing to login with username, password & CAPCTHA. [10]

OR

What are listeners in Java explain with example.

Q5) Create servlet application to display list of passed students in Java (Assume suitable table structure) [10]

OR

What is session tracking? Explain any one method with example.

Q6) Write any two directive tags in jSP with examples. [10]

OR

What are scriptlets in jSP, explain with example.

Q7) Write short note on (any two) [10]

- a) String functions
- b) Inheritance
- c) RMI
- d) Overloading



Total No. of Questions : 8]

SEAT No. :

PC3218

[Total No. of Pages : 2

[6383]-32

S.Y.M.C.A. (Management)

IT - 32 : DATA WAREHOUSING & DATA MINING

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q. 1. & Q. 8. are compulsory.*
- 2) *Solve any five questions from Q. 2. to Q. 7.*
- 3) *Figures to the right indicate full marks.*

Q1) What is linear Regression? Explain various applications of linear regression?[10]

Q2) Explain various types of Data warehouse scheme with suitable example.[10]

Q3) Write Apriori Algorithm and apply it for the following dataset to find the List of Frequent Item - sets, if the Minimum Support Count is 30%, [10]

TID	List of Items
1	a, b, c
2	b, c, d
3	c, d
4	b, d
5	a, c
6	a, c, d

Q4) What is Clustering / Cluster analysis? Explain K - means algorithm for cluster analysis with Suitable example. [10]

Q5) What is Bayesian Classification? Write an example and applications of it.[10]

P.T.O.

Q6) Discuss the K - nearest neighbor classification algorithm with suitable example. **[10]**

Q7) What is OLAP? Write the various OLAP operations with suitable example. **[10]**

Q8) Write Short notes on (Any four) **[10]**

- a) Data Transformation
- b) Neural Network
- c) Web Mining
- d) ETL
- e) KDD
- f) Data visualization



Total No. of Questions : 7]

SEAT No. :

PC3219

[Total No. of Pages : 2

[6383]-33

S.Y.M.C.A. (Management)

IT-33: TESTING AND QUALITY ASSURANCE

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Draw neat diagrams wherever necessary.*

Q1) Write a test plan for the following sections of IEEE 829 test plan template for a Ride-sharing application. **[10]**

- a) Scope of testing
- b) Objectives
- c) Risks
- d) Strategy
- e) Approach

Q2) Describe Software Quality Assurance (SQA) and outline its key activities. **[10]**

OR

Explain the metrics used to assess and measure Reliability. **[10]**

Q3) Describe Inspection process in detail **[10]**

OR

“Early testing improves the quality of a software under development”. Comment **[10]**

Q4) Explain Integration Testing, its types and benefits. **[10]**

OR

Describe white-box testing and discuss any two coverage techniques, including examples. **[10]**

P.T.O.

- Q5)** a) Using Boundary Value Analysis technique, write valid & invalid test case for a ZIP code input field which should accept exactly six digits. [5]
b) Explain Smoke testing. [5]

OR

- c) A system requires users to enter a coupon code that must accept exactly 8 characters, which can be alphanumeric but must include at least one uppercase letter and one digit. Using Equivalence Partitioning, define valid and invalid test cases for this password input requirement. [5]
d) Explain Performance testing. [5]
- Q6)** Mention the factors to be considered in selecting a testing tool in an organisation. [10]

OR

What is CAST? Give reasons for selenium being a widely used testing tool.[10]

- Q7)** Write short notes on (any two) [10]
a) Internationalisation Vs Localisation testing.
b) Security Testing.
c) V Model.
d) Test Roles.



Total No. of Questions : 8]

SEAT No. :

PC3220

[Total No. of Pages : 1

[6383]-34

S.Y. M.C.A. (Management)
IT34 - CLOUD COMPUTING
(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q.1 & Q.8 are compulsory.*
- 2) *Solve any five from remaining.*
- 3) *Draw neat labelled diagram wherever necessary.*

Q1) Define Virtualization. Explain various benefits of Virtualization. **[10]**

Q2) What is cloud security? Explain the various security issues in cloud. **[10]**

Q3) Explain Saas and Web services. **[10]**

Q4) Explain Web (1.0, 2.0 & 3.0) and web operating system. **[10]**

Q5) Explain virtual machine types with examples. **[10]**

Q6) Explain streaming issues and inter cloud issues in cloud computing. **[10]**

Q7) Explain cloud benefits and its limitations. **[10]**

Q8) Write short notes (any two) **[10]**

- a) SOA
- b) AWS
- c) NIST model



Total No. of Questions : 8]

SEAT No. :

PC3221

[Total No. of Pages : 4

[6383]-35

S.Y.M.C.A. (Management)

MT - 31 : PROBABILITY & COMBINATORICS

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Question 1 & Question 8 is compulsory.
- 2) Solve any four questions from question No 2 to question No 7.
- 3) Figures to right indicate maximum marks.
- 4) Use of non - programmable calculator & statistical table is allowed.

Q1) Solve any 3 questions out of 5 (5 marks each)

[3×5=15]

- a) Let X be a random variable with the following distribution

x	:	-3	6	9
P (X = x)	:	$\frac{1}{6}$	$\frac{1}{2}$	$\frac{1}{3}$

Find E (x) and E (X²) and also evaluate E (2x +1)²

- b) What is the probability of getting 9 cards of the same suit in one hand at a game of bridge?
- c) How many four digit number are there :
- i) Without repeating a digit
 - ii) Even numbers without repeating a digit
- d) Given 8×8 chess board
- i) How many squares of all sizes are there on it?
 - ii) How many rectangles of all sizes are there on it?
- e) What is the coefficient of $x^{101}y^{99}$ in the expansion of $(2x - 3y)^{200}$?

P.T.O.

Q2) a) Find coefficient of $x^4y^3z^6$ in the expansion of $(2x^2 - y - 3z^2)^8$ [5]

b) We are given red box, blue box and green box. We are also given 10 red balls, 10 blue balls and 10 green balls, which are identical consider following constraints. [5]

i) No box contains ball of the same colour as the box

ii) No box is empty

Determine the number of ways of putting the 30 balls in the three boxes so that.

1) No constraint is required to be satisfied.

2) Constraint i) is satisfied

3) Constraint ii) is satisfied

Q3) a) Four people North, South, East and West are dealt with 13 cards each from a shuffled deck of 52 cards. [5]

i) If South has no ace, find the probability that his partner (North) has exactly 2 aces

ii) If South and North together have 9 hearts, find the probability of east and west having 2 hearts each.

b) p.d.f of a continuous random variable is given by [5]

$$f(x) = \begin{cases} kx(2-x) & 0 < x < 2 \\ 0 & \text{otherwise} \end{cases}$$

i) Find k

ii) Find $p(x < \frac{1}{2})$

- Q4) a)** How many number of derangements of a set with 7 & 8 elements is? [5]
- b)** A biased coin has probability of heads as $\frac{1}{3}$. This coin is tossed 6 time.
Find the probability of getting [5]
- 4 heads
 - At least 2 heads
 - 4 tails
 - At the most 1 head
- Q5) a)** In a factory past records show that on an average 3 workers are absent without leave per shift. [5]
find the probability that is a shift,
- Exactly two workers are absent
 - At least 3 workers will be absent
- b)** If X is uniformly distributed over (0,10), calculate the probability that.[5]
- $X < 3$
 - $X > 6$
 - $3 < X < 8$
- Q6) a)** Joint probability mass function of a bivariate random variable is given as $p(1, 1) = 0.5$, $p(1, 2) = 0.1$, $p(2, 1) = 0.1$ and $p(2, 2) = 0.3$ calculate conditional p.m.f. given $Y = 1$. [5]
- b)** If a random variable X follows normal distribution with mean 10 and S.D. = 50. Write down its p.d.f. Also calculate [5]
- $p(X \leq -108)$
 - $p(10 < x \leq 108)$
- Q7) a)** p.d.f. of a joint continuous random variable x & y is given as [5]
- $$f(x, y) = xy^2 + \frac{x^2}{8} \quad \text{for } 0 \leq x \leq 2, 0 \leq y \leq 1$$
- $$= 0 \quad \text{otherwise}$$
- compute,
- $p(x > 1)$
 - $p(y < \frac{1}{2})$
- b)** Let the probability of defective bolts be 0.1. Find the mean and standard deviation of defective of defective bolts in a total lot of 400 bolts, if the defective bolts follow binomial distribution. Also find $p(x \leq 1)$. [5]

Q8) Solve any 3 sub questions out of 5.

[3×5=15]

- a) How many seven letter palindromes can be made out of English letter.
- i) If no letter can be repeated?
- ii) If letter can be repeated?
- b) Find number of solutions of $x_1 + x_2 + x_3 + x_4 = 17$ where $x_1, x_2, x_3, x_4 = 17$ where x_1, x_2, x_3, x_4 are non - negative integers such that $x_1 \leq 3$ $x_2 \leq 4$ $x_3 \leq 5$ and $x_4 \leq 8$.
- c) A question paper is divided into 3 sections. A, B & C section A contains 2 questions, section B contain 3 questions and section C contains 4 questions. A student is to answer five questions, of which at least one should be from each section. Find probability that the student attempts 5 questions such that he solves only one question from section A.
- d) The time in years X required to complete a software project has a p.d.f. given by,

$$f(x) = \begin{cases} kx(1-x) & 0 \leq x \leq 1 \\ 0 & \text{otherwise} \end{cases}$$

Compute the probability that the project will be completed in less than four months.

- e) The probability of a man hitting a target is $\frac{1}{4}$.
- i) If he fires 7 time what is the probability of his hitting the target at least twice?
- ii) How many time must he fire so that the probability of his hitting the target at least once is greater than $\frac{2}{3}$?



Total No. of Questions : 7]

SEAT No. :

PC3222

[Total No. of Pages : 2

[6383]-41

S.Y.M.C.A. (Management)

IT-41 : PYTHON PROGRAMMING

(2019 Pattern) (Semester-IV)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Q. No.1 and 7 are compulsory.*
- 2) *Solve any four questions from 2 to 6.*

Q1) a) Explain lambda function with suitable example. **[5]**

b) Write a program to check given input is Armstrong number or not. **[5]**

Q2) a) Write a program to validate email using regular expression. **[5]**

b) Explain inheritance concept, also explain hybrid inheritance with suitable example. **[5]**

Q3) a) Write a program to handle divide by exception. **[5]**

b) Explain the concept multithreading in brief. **[5]**

Q4) a) Draw a horizontal bar chart using mat plot lib **[5]**

b) Write a program to reverse a numpy array using flip() **[5]**

Q5) a) Explain constructor and its types. **[5]**

b) Explain namespace package. **[5]**

Q6) a) Write a program to accept integer to check odd or even **[5]**

b) How many ways data frames can be created using pandas **[5]**

P.T.O.

Q7) Write short note (any four)

[20]

- a) Super class
- b) Write (), Writelines()
- c) Dynamic attributes
- d) Synchronizing the threads
- e) SQL Database connection using Python.



Total No. of Questions : 7]

SEAT No. :

PC3223

[Total No. of Pages : 1

[6383]-42

S.Y. M.C.A. (Management)

IT42 : ESSENTIALS OF ARCHITECTURAL FRAMEWORK

(2019 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q.1 & Q.7 are compulsory.
- 2) Solve any four from remaining.
- 3) Draw neat labelled diagram wherever necessary.

- Q1) a) Explain business framework (eTOM) [7]
b) What is COBIT (Control Objectives for information and related technology) Explain the components of COBIT framework. [8]
- Q2) What do you mean by Architecture? What is the need and what are the characteristics of on Architecture. [10]
- Q3) Explain application architecture operations and its key components. [10]
- Q4) Explain architecture framework roadmaps. [10]
- Q5) What are the software development process in PMI's project management Body of knowledge (PMBOK) [10]
- Q6) Consider a software controlled movable device case study. Identify the challenging problems and design consideration. Propose layered architecture solution for the requirements. [10]
- Q7) Write short notes on any three. [3×5=15]
a) Banking industry architecture network (BIAN)
b) ZACHMAN Framework
c) Six Sigma (6σ)
d) Architecture domain
e) MSP (Managing Successful Programme)



Total No. of Questions : 5]

SEAT No. :

PC3224

[Total No. of Pages : 2

[6383]-43

S.Y.M.C.A. (Management)

**IT 43 : KNOWLEDGE REPRESENTATION & ARTIFICIAL
INTELLIGENCE**

(2019 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Figures to the right indicate full marks.*

Q1) a) List and explain the applications of Artificial Intelligence. **[10]**

b) What is propositional logic and predicate logic? Differentiate between them with suitable examples. **[10]**

Q2) a) Summarize techniques of knowledge representation in AI. **[10]**

OR

b) What are the Properties of good knowledge-based system. **[10]**

Q3) a) What is the role of Agents? Explain the Architecture of Agents in AI. **[10]**

OR

b) Define Production systems and its characteristics. **[10]**

Q4) a) Differentiate between Partial order planning, Hierarchical planning and Conditional Planning. **[10]**

OR

b) Discuss AND-OR graph with example. **[10]**

P.T.O.

Q5) Write a short note on (Any Four)

[20]

- a) Intelligent Agents
- b) State space search
- c) Components of planning system.
- d) Bayes' Theorem.
- e) Partial order planning



Total No. of Questions : 8]

SEAT No. :

PC3225

[Total No. of Pages : 4

[6383]-44

S.Y. M.C.A. (Management)

MT - 41 : OPTIMIZATION TECHNIQUES
(2019 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Question No.1 is compulsory.
- 2) Attempt any five from remaining questions.
- 3) Figures to the right indicate full marks.
- 4) Use of non - programmable calculator standard table is allowed.

- Q1) a) A computer centre has four expert programmers and need to develop four application programmes. The head of computer center, estimates, the computer time (in minutes) required by the respective experts to develop the application programmes as follows. [10]

	Programmes				
		A	B	C	D
	1	120	100	80	90
	2	80	90	110	70
	3	110	140	120	100
	4	90	90	80	90

Find assignment pattern that minimises the time required to develop the application programmes. [10]

- b) Solve the given LPP graphically

$$\text{Maximize } Z = 15x_1 + 10x_2$$

Subject to constraints

$$4x_1 + 6x_2 \leq 360$$

$$3x_1 + 0x_2 \leq 180$$

$$0x_1 + 5x_2 \leq 200$$

$$\text{and } x_1, x_2 \geq 0$$

P.T.O.

- Q2)** Suppose that there are five jobs, each of which has to be processed on two machines A and B in the order AB. Processing times are given in the following table **[10]**

Job	1	2	3	4	5
Machine A	6	2	10	4	11
Machine B	3	7	8	9	5

Determine a sequence in which these jobs should be processed so as to minimize the total processing time.

- Q3)** A self service store employee one cashier at its counter. Nine customers arrive on an average every five minutes while the cashier can serve 10 customers in five minutes. Assuming poisson distribution for arrival rate and exponential distribution for service rate, find. **[10]**

- Average number of customers in the system
- Average number of customers in queue
- Average time a customer spends in the system
- Average time a customer waits before being served.

- Q4)** Solve the following game. Find the optimal strategy of A and B. Value of game. The pay off matrix is as given below. **[10]**

		Player B				
		B ₁	B ₂	B ₃	B ₄	B ₅
Player A	A ₁	9	3	1	8	0
	A ₂	6	5	4	6	7
	A ₃	6	4	3	3	8
	A ₄	6	6	2	7	9

Q5) The following table gives different activities and relevant data:

[10]

Activity	Immediate Predecessor	Duration		
		Most Likely	Optimistic	Pessimistic
A	-	5	4	6
B	-	12	8	16
C	A	5	4	12
D	B	3	1	5
E	D, A	2	2	2
F	B	5	4	6
G	C, E, F	14	10	18
H	G	20	18	34

- Draw PERT network for the project.
- Find expected project duration and variance.
- What is the probability that the length of the critical path does not exceed 60 days.

Q6) The cost of a machine in Rs. 6,100 and its scrap value is only Rs. 100. The maintenance costs are found from experience to be:

[10]

Year	1	2	3	4	5	6	7	8
Maintenance cost in Rs.	100	250	400	600	900	1250	1600	2000

When should machine be replaced?

Q7) A company has three production facilities S_1 , S_2 and S_3 with production capacity of 7, 9 and 18 units (in 100s) per week of a product. Respectively These units are to be shipped to four warehouses D_1 , D_2 , D_3 and D_4 with requirement of 5, 8, 7 & 14 per week respectively. The transportation cost (in rupees) per unit between factories to warehouse are given in table below:[10]

	D_1	D_2	D_3	D_4	Supply
S_1	19	30	50	10	7
S_2	70	30	40	60	9
S_3	40	8	70	20	18
Demand	5	8	7	14	34

Use Vogel's Approximation Method (VAM) to find an initial basic feasible solution to the transportation problem.

Q8) A manufacturing company has determined from the analysis of its accounting and production data that for a certain part demand is 9000 units per annum which is uniformly distributed over the year. Unit cost price of that part is Rs. 3 and ordering cost Rs. 40 per order. Inventory carrying cost is 9% of the inventory value the company works for 300 days in a year. Elapsed time is 9 days. [10]

- Find the optimum number of orders per annum
- Optimum lot size
- Total cost for economic order quantity
- Reorder level



Total No. of Questions : 6]

SEAT No. :

PC3226

[6383]-45

[Total No. of Pages : 2

S.Y.M.C.A. (Management Faculty)

BM41: INFORMATION SYSTEM AND SECURITY AUDIT

(2019 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Draw neat labeled diagrams wherever necessary.*

Q1) Kanban Leading Ltd is a company providing customer and internet banking facilities. Its main customers are some of the biggest banks of Japan. Its employees, who have access to all the financial accounts, personal data and ATM card information of approximate 30 million clients of these banks. You have been deputed as Security Administrator and have been allocated the duty to examine the possible security breaches which might occur. **[10]**

- a) What are the different types of threats and vulnerabilities you might identify?
- b) What are your suggestions to control these threats?

Q2) a) Explain the components of ISMS. **[5]**

b) Explain the 3 pillar's (CIA) of Information Security. **[5]**

Q3) JayKisan textile factory decided to computerized their operations by using SMS plugging services for communication with cotton producing farmers. You have been deputed by your software company as information security policy maker for this sugar factory. **[10]**

- a) Which security policies you will design for this case.
- b) What security standards you will going to prose for practicing in above case.

P.T.O.

Q4) What is information Security Controls? Explain AES algorithm. [10]

Q5) a) Government authority is planning to implement online voting system for all typeselections of their country. You have been deputed as an IT Auditor to identify the possible threats and input control for such system. [10]

i) Explain physical access control in IS Audit

ii) Auditing steps details

b) Explain IT governance framework COBIT in detail. [10]

OR

a) The trading company is implementing e-SCM and e-CRM system for their day today operations. You have been asked to conduct technology based audit and suggested to do following types of testing as- [10]

i) Write vulnerability scanning process

ii) Write steps for penetration testing

b) Explain IT governance framework ITIL in detail. [10]

Q6) Write short note on (any two) [2×5=10]

a) Vulnerability Scanning

b) IT governance maturity model

c) Need for security audits in organization

d) Database security



Total No. of Questions : 8]

SEAT No. :

PC4856

[6383]-51

[Total No. of Pages :2

T.Y.M.C.A. (Management)

IT-51 : SOCIAL MEDIA AND DIGITAL MARKETING

(2019 Pattern) (Semester- V)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Questions 1 & 8 are compulsory.*
- 2) *Solve any 5 questions from remaining.*
- 3) *Figures to the right indicate full marks.*

Q1) FasionInd.com is a leading online retailer, offering a wide range of trendy clothing and accessories for men and women. Despite having a good product range, the company faced tuff competition and want to enhance its digital marketing efforts to maintain a competition. This case study explores how FasionInd.com implemented various digital marketing strategies to promote brand awareness, increase website traffic, and boost sales. Being a Digital Marketing Executive, how will you create and promote their Digital Marketing platform. **[10]**

Q2) Explain various tools of social media and Digital Marketing? **[10]**

Q3) Discuss branding strategies of Social Media. **[10]**

Q4) What is on page & off page optimization? Explain How it works. **[10]**

Q5) What is Redirecting of URL? Explain few redirect types. **[10]**

Q6) How social media marketing is distinct from traditional marketing? Justify?[10]

P.T.O.

Q7) Compare search engine optimization and search engine marketing. **[10]**

Q8) Write short note on (Any two) **[10]**

- a) SWOT Analysis of Business
- b) Off page optimization
- c) Google sandbox



Total No. of Questions : 7]

SEAT No. :

PC-4857

[Total No. of Page : 1

[6383]-52

M.C.A. (Management)

IT-52 : MOBILE APPLICATION DEVELOPMENT

(2019 Pattern) (Semester -V)

Time : 3Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Question No. 1 &7 one compulsory.*
- 2) *Solve any four questions from 2 to 6.*
- 3) *Figures to the right indicate full marks.*

Q1) Explain Android Architecture in detail with the help of diagram. **[10]**

Q2) What is Fragment? Explain Fragment life cycle in detail. **[10]**

Q3) What is Adapters & its different types? Design an android application to display list of items using List view. **[10]**

Q4) Design an android application for "Conference Registration" Write an android code to store & retrieve registration details by using SQLite.
(Assume suitable table structure) **[10]**

Q5) What is web view? Design an android application that accepts a web VRL address as input from user & displays the corresponding web page. **[10]**

Q6) What is Intent? Design an android application by using Implicit Intent.**[10]**

Q7) Write short notes : (Any four) **[20]**

- a) React Native
- b) Flutter Architecture
- c) Views & view Groups
- d) Firebase
- e) ADB & DVM



Total No. of Questions : 6]

SEAT No. :

PC-4440

[Total No. of Pages :2

[6383]-53

M.C.A. (Management)

IT53: SOFTWARE PROJECT MANAGEMENT

(2019 Pattern) (Semester - V)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All the questions are compulsory.*
- 2) *Number showing on the right side indicates full marks.*

Q1) Attempt the following (Any 4):

[4 × 5 = 20]

- a) Role of Project Manager
- b) SEI Capability Maturity Model
- c) Burn Down Chart
- d) Kanban Board
- e) MS Project
- f) Story point and Velocity

Q2) a) A national retail chain, SmartShop, has decided to implement a new Customer Relationship Management (CRM) system to enhance its customer service and improve sales through better customer data analysis. The new system will allow to track customer interactions, manage marketing campaigns, and personalize customer experiences across all its locations. As the project manager, suggest a risk management strategy for any four identified potential risks. **[10]**

OR

b) Briefly explain the phases of Project Management Life Cycle **[10]**

.Q3) a) We are undertaking a Project Alpha, which involves developing a semi-detached software with a size of 70,000 DSI (Delivered Source Instructions). The software falls into a mission- critical area, requiring a high level of reliability (RELY=high=1.15). Estimate the effort, schedule, productivity, and average staffing for the project based on the given information. **[10]**

P.T.O.

OR

- b) Analyzing a software project, the following functional components are identified: External Inputs, External Outputs, External Inquiries, Internal Logical Files and External Interface Files. The determined counts for each component are as follows: EI = 20, EO = 15, EQ = 8, ILF = 10, and EIF = 8. Consider the weighing factors to be average, and the influencing adjustment factors as Complex internal processing = 3, Code to be reusable = 2, High performance = 4, Multiple sites = 3 Distributed processing = 5. Calculate the Function Point Analysis (FPA) for this project based on the given counts. **[10]**

Q4) a) Describe the Agile Manifesto Principles and Values. **[10]**

OR

- b) Explain the Agile concepts of Minimum Viable Product (MVP) and swimlanes, and describe how these concepts are related. **[10]**

Q5) a) Describe the Agile Team roles and responsibilities. **[10]**

OR

- b) Brief any four Agile project key metrics. **[10]**

Q6) a) What is Agile Estimation? Explain Bucket System estimation technique. **[10]**

OR

- b) As a member of the Agile development team for a cloud kitchen application, create two user stories for the following features and define its acceptance criteria (in GIVEN/WHEN/ THEN format) **[10]**
- i. Add dishes to Cart
 - ii. Place an Order

