

Total No. of Questions : 5]

SEAT No. :

PE-1965

[Total No. of Pages : 2

[6554]-101

First Year M.C.A. (Management)

IT-11 : JAVA PROGRAMMING

(Rev. 2020) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

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

- Q1)** a) Explain constructor overloading with suitable example. [7]
b) Explain the use of "this" keyword. [3]

OR

- c) Explain multiple inheritance using interface with example. [7]
d) Differentiate between Normal class & Abstract class. [3]

- Q2)** a) Explain five keywords of exception handling with example. [5]
b) Explain the importance of thread synchronization with example. [5]

OR

- c) Explain thread creation by using Runnable interface with example. [5]
d) Write a program to check user inputted string value is polindrom or not.[5]

- Q3)** a) What is set? Ellaborate it with example. [5]
b) Discuss List collection class in detail. [5]

OR

- c) Write a program to find a element from map collection. [5]
d) Explain Hashing in detail. [5]

P.T.O.

Q4) a) Design following workshop registration GUT.

[10]

User Name	
College Name	
Title	
City	▾
Gender	☐ Male ☐ Female
Submit	

OR

b) Explain MouseListener. Implement all it's methods with example. **[10]**

Q5) a) Create Employee table with fields Employee id, Employee name, Employee Department, Employee post, Employee salary. Perform CRUD operations on Employee table (Using JDBC). **[10]**

OR

b) Write a program to find factorial of a given number by using servlet.**[10]**



Total No. of Questions : 5]

SEAT No. :

PE-1966

[Total No. of Pages : 2

[6554]-102

M.C.A. (Management)

IT-12 : Data Structure and Algorithms
(Revised 2020) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) a) Write an algorithm to insert nodes in singly linked list. [6]

b) Write an algorithm to copy elements from stack to queue. [4]

OR

c) Demonstrate the implementation of stack using linked list. [6]

d) Discuss FIFO concepts with suitable example. [4]

Q2) a) Construct AVL tree for the following [6]

10, 8, 15, -12, 13, 7, -3, 12

b) Discuss graph representations (Adjacency Matrix and Adjacency List) with suitable example. [4]

OR

c) Construct segment tree for max. query for the following data. [6]

1, 3, 5, 7, 9, 11

d) Explain any 2 hash functions, with suitable example. [4]

Q3) a) Apply the rain terrace algorithm to the following problem Input : [6]

[3, 0, 2, 0, 4]

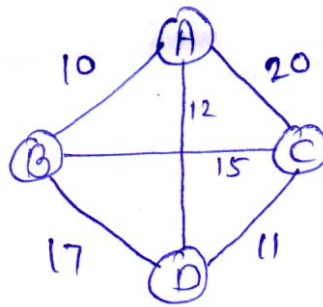
Draw the figure & find the stepwise solution.

b) Discuss Hamiltonian cycle with suitable example. [4]

OR

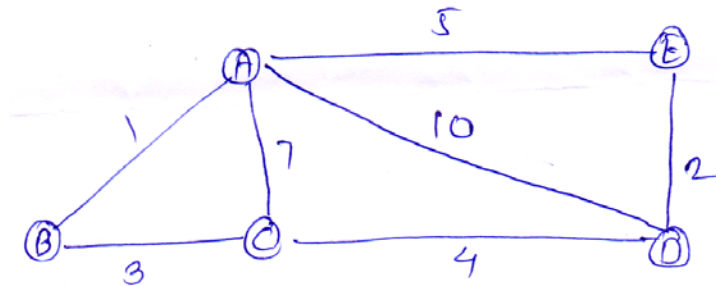
P.T.O.

- c) Find the shortest path using travelling salesman problem for following graph. [6]



- d) Discuss N-Queens problem with suitable example. [4]

- Q4)** a) Illustrate the stages in finding the minimum cost spanning tree for the given graph using Prim's Algorithm. [6]



- b) Explain Tower of Hanoi for $n = 3$ [4]

OR

- c) Sort the following data stepwise, using quick sort. [6]

8, 73, 17, 23, 68, 60, 5, 101

- d) Differentiate between linear search and Binary search. [4]

- Q5)** a) Find the longest common substring using dynamic programming for the following strings $X = \text{"highlight"}$ and $Y = \text{"Lighting"}$. [10]

OR

- b) Consider the given instance of O/I Knapsack problem. [10]

$n = 4, m = 8, p = (2, 3, 1, 4) W = (3, 4, 6, 5)$

using dynamic programming determine the optimal profit and the solution vector.



Total No. of Questions : 5]

SEAT No. :

PE-1967

[Total No. of Pages : 2

[6554]-103

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

IT-13: OBJECT ORIENTED SOFTWARE ENGINEERING

(Rev. 2020) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

- 1) *All questions are compulsory.*
- 2) *Draw neat diagrams wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) a) Explain rational unified process model. **[5]**

b) Describe extreme programming in detail. **[5]**

OR

a) Explain prototype model. **[5]**

b) Describe current trends in software engineering. **[5]**

Q2) a) Prepare SRS as per IEEE format for G20 summit management system.
The overall functioning is as follows **[10]**

- i) G20 member registration
- ii) G20 member invitation
- iii) Schedule preparation
- iv) Expenses tracking for the G20 summit

OR

b) Prepare SRS as per IEEE format for a system to be developed for scheduling the courses in MCA programme based on the Input about classroom, lecture times, and time preference of different teachers. **[10]**

P.T.O.

Q3) a) Draw use case diagram and class diagram for plagiarism checking software that can perform below task as **[10]**

- i) Scan for matches between your text and existing texts.
- ii) Highlights the material that is copied
- iii) Calculate the originality of existing diagram.

OR

b) Draw collaboration diagram and sequence diagram for Blood donation system. **[10]**

Q4) a) Design GUI form by using appropriate UI design elements for loan application. **[5]**

b) Design activity diagram for Noise pollution complaint registration system. **[5]**

OR

a) Design GUI form by using appropriate UI design for feedback form of one day Data Science workshop. **[5]**

b) Draw state transition diagram for an Elevator. **[5]**

Q5) Write short notes on following (any two) : **[2 × 5 = 10]**

- a) Generalization and Association
- b) Scrum
- c) Inheritance and polymorphism



Total No. of Questions : 5]

SEAT No. :

PE-1968

[Total No. of Pages : 2

[6554]-104

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

IT-14 : OPERATING SYSTEMS CONCEPTS

(Rev. 2020) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) a) Explain logical & physical memory mapping. [5]

b) Explain various memory management techniques in brief. [5]

OR

c) What is operating system? Explain characteristics of OS? [5]

d) Explain page replacement algorithms in brief. [5]

Q2) a) What is deadlock? Explain how deadlock can be avoided. [5]

b) What is mobile operating system? Explain types of mobile OS. [5]

OR

c) Identify the number of page faults for the given reference string using LRU, FIFO for three frame list. [5]

7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1

d) Under what circumstances do page fault occur? Describe the action taken by the operating system when page fault occurs. [5]

P.T.O.

- Q3) a)** Consider the set of 6 processes whose arrival time and burst time are given below : [6]

Process	Arrival Time	Burst Time
P ₁	0	4
P ₂	1	5
P ₃	2	2
P ₄	3	1
P ₅	4	6
P ₆	6	3

If the CPU scheduling policy is Round Robin with time quantum = 2, calculate the average waiting time and average turnaround time.

- b) What is RTOS? Explain application of RTOS. [4]

OR

- c) Explain the difference between UMA, NUMA & NORMA? [5]
d) Explain the overview of control panel in window OS. [5]

- Q4) a)** Explain Loops in Linux scripting. [5]

- b) Write a shell script for adding two numbers and storing the result in a variable. [5]

OR

- c) Explain Linux command with example. [5]
i) Cat ii) PS.
iii) Chmod iv) Rmdir
v) Man
d) Write shell script to calculate simple interest. [5]

- Q5)** Write short notes on any two : [10]

- a) Kernel
b) CPU states
c) Asymmetric multiprocessor
d) PCB



Total No. of Questions : 5]

SEAT No. :

PE-1969

[Total No. of Pages : 2

[6554]-105
F.Y.M.C.A. (Management)
IT15: NETWORK TECHNOLOGIES
(Rev. 2020) (Semester - I)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

- 1) All questions are compulsory.*
- 2) All questions carry equal marks.*
- 3) Draw neat diagrams wherever necessary.*

- Q1)** a) Explain ethernet specification and frame format. **[4]**
- b) Explain OSI layered architecture with diagram? **[6]**

OR

- a) Explain Connection oriented networks Vs Connection less networks with proper steps. **[4]**
- b) Explain TCP/IP layering concept **[6]**
- Q2)** a) Explain IP Addressing scheme with host part and network part. **[4]**
- b) The received Hamming code word is 101101010. Using odd parity locate and correct the bit in error. **[6]**

OR

- a) Explain IP address format for Class A, Class B, Class C, Class D
Determine the network address for following IP Addresses: **[4]**
- i) 83.41.57.10
- ii) 194.38.14.13
- iii) 143.62.11.18
- b) Describe any one error correction techniques. **[6]**

P.T.O.

Q3) a) Find the maximum number of hosts available on a class-B address with a subnet mask of 255.255.255.192. [4]

b) Describe PPP protocol with its advantages and limitations. [6]

OR

a) Draw and explain IPv6 packet format. [4]

b) A bit stream 1101011011 is transmitted using the standard CRC method. The generator polynomial is x^4+x+1 . What is the actual bit string transmitted? [6]

Q4) a) Explain security attacking schemes. [4]

b) What is HTTP? Explain the status code used in error handling of HTTP. [6]

OR

a) What is cryptography. Explain asymmetric cryptography [4]

b) Write POP3 & IMAP4 email protocols in detail [6]

Q5) a) Explain with an example distance vector protocol. [4]

b) Create a TCP socket program to connect two machines. [6]

OR

a) What is IP Routing? Describe different routing protocols. [4]

b) Write program for implementing the sliding window protocol of window size 5 [6]



Total No. of Questions : 5]

SEAT No. :

PE-1970

[Total No. of Pages : 2

[6554]-201
M.C.A. (Management)
IT-21: PYTHON PROGRAMMING
(Rev. 2020 Pattern) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

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

Q1) a) Explain generators in python with suitable example. **[5]**

b) Write a program to print add numbers between 1 to 100 using for loop. **[5]**

OR

c) Write a program to print all prime numbers between 1 to 100. **[5]**

d) What is a set? Explain with suitable example. **[5]**

Q2) a) Explain multithreading using suitable example. **[5]**

b) Write Multithread program, where one thread prints square of a number and another thread print cube of numbers. **[5]**

OR

c) Write a program to validate URL using regular expression. Also explain the meaning of each and every special character of the regular expression used by you in the program. **[5]**

d) How to handle multiple exceptions? Discuss with suitable example. **[5]**

- Q3)** a) Discuss the polymorphism concept in python. [5]
b) Write a program to overload binary + operator to perform addition of two complex numbers. [5]

OR

- c) Write a python program to create a class that represents a shape. Include methods to calculate the area and perimeter. Implement subclasses for different shapes like circle, triangle and square. [5]
d) Explain static keyword in python. Give suitable examples. [5]

- Q4)** a) Write a program to print the number of lines, words and characters present in the given file. Accept the filename from user. [5]
b) Write a program to retrieve and display student details from “Students” collection stored in MongoDB database. [5]

OR

- c) Write a python Program using MongoDB to create a “Library” collection having fields, BookTitle, BookAuthor, BookPages, BookPrice, Accept input from user to insert documents. [5]
d) What is NOSQL database? Discuss the advantages of NOSQL database. [5]

- Q5)** a) Discuss the significance of Pandas in data analysis. [5]
b) Create a 4×3 numpy array and find its column wise mean. [5]

OR

- c) Prepare the pandas dataframe from CSV file and perform following operations: [5]
i) Fill all ‘NaN’ values with the mean of respective columns.
ii) Display last 5 rows.
d) Draw piechart using Python library using suitable example. [5]



Total No. of Questions : 5]

SEAT No. :

PE-1971

[Total No. of Pages : 2

[6554]-202

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

IT-22 : SOFTWARE PROJECT MANAGEMENT

(Rev. 2020) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions are compulsory.
- 2) Draw neat diagrams wherever necessary.
- 3) Use of scientific calculator is allowed.

Q1) a) Bharat University wants to automate their examination system right from submission of the examination forms up to the result declaration. As a project manager, you have to [6]

- i) Identify various kinds of risks involved with it
- ii) Propose the suitable solution for the same.

b) Explain various agile tools in brief. [4]

OR

c) Elaborate the roles and responsibilities of project manager. [6]

d) Write and explain various quality metrics. [4]

Q2) a) Explain SEI capability maturity model in brief. [6]

b) Write a short note on software configuration management. [4]

OR

c) Given the project size of 16,000 LOC, you are required to calculate the effort and time using COCOMO-I model. [6]

d) Explain various Agile principles. [4]

Q3) a) Use the COCOMO-II model to estimate the effort required to build software for a simple movie ticket booking system that produces 15 screens, 14 reports and will require approximately 75% as new software components. Assume average complexity and average developer maturity. Use the application composition model with object points. [6]

b) What is version and release management. Explain its benefits in project management. [4]

P.T.O.

OR

- c) Explain Delphi cost estimation technique in detail. [6]
- d) Explain T-shirt sizing technique for estimating story point. [4]

- Q4)** a) Scenario : User wants to request cash from his/her account at any ATM. [6]
- i) Write user story for the scenario above.
 - ii) Write an acceptance criteria for the user story in given/when/Then Format.
- b) Explain the process to plan and execute iteration in agile with suitable example. [4]

OR

- c) Explain the role of scrum master, product owner and development team. [6]
- d) Write short note on agile reports. [4]

- Q5)** a) Consider a project with following functional units [6]
- i) No. of user inputs = 40
 - ii) No. of user outputs = 30
 - iii) No. of user inquiries = 20
 - iv) No. of user Files = 06
 - v) No. of external interfaces = 04
- In addition to the above, system requires significant
- Data communication
 - Performance is very critical
 - Designed code may be moderately reusable
- Other complexity factors are treated as Average compute the Functional point for the project.
- b) Explain product Backlog and sprint Backlog with example. [4]

OR

- c) Explain the process of Retrospective, making team decisions and closing retrospective. [6]
- d) Write short note on GitHub. [4]



Total No. of Questions : 5]

SEAT No. :

PE-1972

[Total No. of Pages : 2

[6554] - 203

F.Y.M.C.A. - (Management Faculty)

IT-23: ADVANCED INTERNET TECHNOLOGIES

(Revised 2020) (Semester - II)

Time : 2 ½ Hours]

[Max. Marks : 50

Instructions to the candidates :

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

Q1) a) What is HTML5? Explain its features and advantages. [5]

b) Write CSS for div tag: border 1, color- blue, height-80px, width-80px, background color- red; [5]

OR

c) Explain any three types of selectors in CSS3 with suitable example. [5]

d) Explain <audio> and <canvas> tags in HTML5 with suitable example. [5]

Q2) a) What is NodeJS? Explain event handling with suitable example. [5]

b) Design a login page & validate the user details in NodeJS by using body-parser module. [5]

OR

c) What is NPM in NodeJS? Explain express module with example. [5]

d) Write a program in NodeJS to perform file CRUD operations by using fs module. [5]

Q3) a) Explain the usage of module and components in Angular. [5]

b) Create an Angular program which will demonstrate the use of ngswitch directive. [5]

OR

P.T.O.

- c) What are the advantages of services in Angular? [5]
- d) Explain various types of filters in Angular with example. [5]

Q4) a) Write a PHP script to design a form for railway reservation. Insert the records in database and display all the inserted records on a web page. (Assume suitable table structure) [10]

OR

- b) Explain difference between GET and POST method. [5]
- c) Write a program to store the username in a cookie and check whether the user has successfully logged in or not. [5]

Q5) Write Short Note (Any two) [10]

- a) REPL
- b) Angular Binding
- c) Associative Array in PHP



Total No. of Questions : 5]

SEAT No. :

PE-1973

[Total No. of Pages : 2

[6554] - 204

M.C.A. - I (Management)

IT-24 : ADVANCED DBMS

(Revised 2020) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

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

Q1) Kohinoor hotel is in the process of computerization of rooms, hall and venue booking and invoicing payment tracking system. This helps to minimize the ability to rent out empty rooms, halls and venues and prevent duplicate reservations. They have to indicate the period for which they need a number of rooms, halls & venue. The reservation can be cancelled or the dates and number of rooms, halls can be changed. for reservation, cancellation, or modification of rooms, hall & venue customer receives an acknowledgement from the hotel.

- a) Draw the E-R diagram for the above system.

OR

- b) Design the normalized database upto BNF from the above case study.[8]

Q2) a) Describe the database's B-tier schema architecture. [5]

- b) What do you understand by OODBMS? Explain the characteristics of OODBMS. [5]

OR

- c) Describe the client - server architecture. [5]

- d) Explain the mobile database with its architecture. [5]

Q3) a) Explain the Failure classification in detail. [5]

- b) Explain different types of Access controls in database security. [5]

OR

P.T.O.

- c) Describe the database backup system with its types. [5]
- d) Write a short note on Mandatory Access control. [5]

- Q4)** a) Explain the conflict serializability and view serializability with a suitable example. [6]
- b) What is NO SQL Database? [2]

OR

- c) Demonstrate with an example 2PC protocol using growing and shrinking phase. [6]
- d) State the types of NO SQL. [2]

- Q5)** a) Explain data partitioning techniques in parallel database with examples. [7]
- b) Differentiate between Homogeneous and Heterogeneous databases. [7]

OR

- c) Describe I/O parallelism in detail. [7]
- d) Explain Lock Manager in distributed database system. [7]



Total No. of Questions : 5]

SEAT No. :

PE-1974

[Total No. of Pages : 5

[6554]-205

M.C.A. (Management)

MT 21 : OPTIMIZATION TECHNIQUES

(Revised 2020) (Semester - II)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates :

- 1) All questions compulsory.
- 2) Use of statistical table and non-programmable calculator is allowed.
- 3) Figures to the right indicate full marks.

Q1) a) Use Simplex Method to solve the following LP problem. A factory manufactures two types of gadgets, regular and premium. Each gadget requires the use of two operations, assembly and finishing and there are at most 12 hours available for each operation. A regular gadget requires 1 hour of assembly and 2 hours of finishing, while a premium gadget needs 2 hours of assembly and 1 hour of finishing. Due to other restrictions, the company can make at most 7 gadgets a day. If a profit of \$20 is realized for each regular gadget and \$30 for a premium gadget, how many of each should be manufactured to maximize profit? **[10]**

OR

b) Use Two Phase simplex to solve the following LP problem

$$\text{MAX } Z = 5x_1 + 2x_2 + 10x_3$$

subject to

$$2x_1 - 5x_3 \leq 13$$

$$2x_2 + 7x_3 \geq 12$$

$$\text{and } (x_1, x_2, x_3) \geq 0$$

P.T.O.

- Q2) a)** A petrol station owner is considering the effect on his business (Superpet) of a new petrol station (Global) which has opened just down the road. Currently (of the total market shared between Superpet and Global) Superpet has 70% of the market and Global has 30%. Analysis over the last week has indicated the following probabilities for customers switching the station they stop at each week : [7]

		To	
		Superpet	Global
From	Superpet	0.65	0.35
	Global	0.45	0.55

What would be the long-run prediction for the expected market share for Superpet and Global?

- b)** A major consumer goods manufacturer wishes to decide new product bring out in the market which of the profit table are as follows (profit are in units of Rs.10000) [3]

Strategies	States		
	S1(0.4)	S2(0.5)	S3(0.1)
A1	140	100	80
A2	160	130	120
A3	200	160	140

Determine

- Expected Monetary Value (EMV)
- Expected Monetary Value with perfect information (EMVPI)
- Value with perfect information (VPI)

OR

- c)** Under a skill development programme, it is proposed to allow sale of sandwich on the buses during off-peak hours. The vendor can purchase the sandwich at a special concessional rate of 15 rupees per unit against the selling price of 35 rupees. Any unsold copies are, however, a dead loss. The vendor has estimated the following probability distribution for the number of copies demanded : [7]

- (a) How many copies should he order so that his expected profit will be maximum?

Number of copies :	15	16	17	18	19	20
Probability :	0.04	0.19	0.33	0.26	0.11	0.07

- d) The following matrix gives the payoff of different conditions (events) E1, E2, E3 and E4 against strategies (alternatives) (A1, A2, A3, A4). Indicate the decision under regret approach if [3]

$$P(E1) = 0.25, P(E2) = 0.35, P(E3) = 0.25, P(E4) = 0.15$$

Find the regret table from the following pay-off table

Events / State of Nature Outcomes	Actions/Strategies			
	A1	A2	A3	A4
E1	20	40	-20	60
E2	30	50	20	320
E3	-20	10	30	310
E4	60	30	110	45

- Q3) a)** We have 5 jobs each of which must go through the machine A,B,C in the order BAC. Processing time is as follows : [7]

Job	1	2	3	4	5
Machine A	3	7	5	6	7
Machine B	12	10	8	9	7
Machine C	5	8	6	9	5

- i) Find optimal job sequence, total elapse time
 ii) Find idle time for Machine A , Machine B and Machine C
- b) The following matrix gives the payoff of different strategies (alternatives) S_1, S_2, S_3 against conditions (event) N_1, N_2, N_3 and N_4 : Indicate the decision taken under the following approach : [3]

- i) Pessimistic
 ii) Equal probability

	N1	N2	N3	N4
S1	4	0	-5	3
S2	-2	6	9	1
S3	7	3	2	4

OR

- c) We have 5 jobs each of which must go through the machine A,B,C in the order ABC. Processing time is as follows : [7]

Job	1	2	3	4	5
Machine A	3	7	5	6	7
Machine B	2	4	6	5	4
Machine C	5	8	6	7	5

Determine the order in which the jobs should be processed in order to minimize the total time required to process all the jobs and also find the total idle times for each machine.

- d) What is the difference between 'decision making under risk' and 'decision making under uncertainty'? [3]

- Q4) a)** A small project consists of seven activities for which the relevant data are given below : [10]

Activity	Preceding Activities	Activity Duration (Days)
A	-	5
B	-	8
C	-	7
D	A,B	6
E	A,B	7
F	C,D,E	5
G	C,D,E	3
H	G	4

Draw the network diagram and find Total Float for each activity

OR

- b) A small project consist some activities whose time estimates are as follows:[10]

Activity	Immediate Predecessors	Most Likely	Optimistic	Pessimistic
A	---	1	1	7
B	A	4	1	7
C	A	2	2	8
D	B,C	1	1	1
E	C,D	5	2	14
F	E	5	2	8
G	D,F	6	3	15

Determine :

- Draw network diagram and identify critical path.
- Determine probability of completing the project in 13 weeks.

Q5) a) Two player A and B match coins. If the coins match, then A wins five units of value, if the coin do not match, then B win 5 units of value. Determine the optimum strategies for the players and the value of the game. [7]

b) A firm manufactures three types of products. The Fixed and variable costs are given below : [3]

	Fixed Cost (Rs.)	Variable Cost per Unit (Rs.)
Product A :	25,000	12
Product B :	35,000	9
Product C :	53,000	7

The Likely demand (units) of the products is given below :

Poor Demand	3,000
Moderate Demand	7,000
High Demand	11,000

If the sale price of each type of product is Rs. 25, then prepare the payoff matrix

OR

c) Find Solution of game theory problem using dominance method [7]

Player A \ ^{Player B}	B1	B2	B3	B4
A1	3	5	4	2
A2	5	6	2	4
A3	2	1	4	0
A4	3	3	5	2

d) Explain following : [3]

- i) Types of Strategy in game theory
- ii) Infeasible Solution for LPP



Total No. of Questions : 5]

SEAT No. :

PE1975

[Total No. of Pages : 1

[6554]-301

Second Year M.C.A. (Management)

IT 31 : MOBILE APPLICATION DEVELOPMENT

(Revised 2020 Pattern) (Semester-III)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *All questions carry equal marks.*

Q1) a) Explain Android Architecture with suitable diagram. **[10]**

OR

b) Explain iOS Architecture in detail. **[10]**

Q2) a) Explain different types of menus. Explain any one menu with suitable example. **[10]**

OR

b) Write a program to display a list of items in a listview using ArrayAdapter. **[10]**

Q3) a) Write an android application to write JSON data into a file and read JSON data from created file. **[10]**

OR

b) What is web service? Explain with suitable example. **[10]**

Q4) a) Write SQLite code for updating product details in product table. (Assume suitable table structure). **[10]**

OR

b) Write android application using firebase to insert product details and check for unique product Id. **[10]**

Q5) a) Explain React Native Alert API with suitable example. **[10]**

OR

b) Explain Flutter architecture with suitable diagram. **[10]**



Total No. of Questions : 5]

SEAT No. :

PE1976

[Total No. of Pages : 3

[6554]-302

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

IT - 32 : DATA WAREHOUSING AND DATA MINING

(Revised 2020 Pattern) (Semester - III)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) a) Define data warehouse and explain data warehouse development life cycle.[5]

b) What is metadata? Classify meta data in detail. [5]

OR

c) Discuss different architectures of OLAP. [5]

d) Describe Top-down and Bottom - up approaches of data warehouse design. [5]

Q2) a) What is ETL? Categorise extraction methods. [5]

b) Explain any five ETL tools. [5]

OR

c) Brief the data loading process with neat diagram. [5]

d) Why data cleaning is needed in data pre processing? Describe the steps in data cleaning. [5]

Q3) a) Compare data warehouse & data mining. [5]

b) Define web mining. Explain types of web mining. [5]

OR

c) State descriptive modeling steps in data mining. [5]

d) Define text mining. Discuss applications of text mining. [5]

P.T.O.

- Q4) a)** Apply kNN algorithm and predict the type of fruit or fruit type for the instance tomato (sweet = 6, crunch = 4). [5]

Item	Sweet	Crunch	Food Type
Grapes	8	5	Fruit
Green bean	3	7	Vegetable
Nuts	3	6	Protein
Orange	7	3	Fruit

- b) Write the algorithm for decision tree. From a decision tree for classification of a person in to health condition as high risk or low risk. Consider the below attributes for classification. [5]

- i) Age
- ii) Weight
- iii) Life style

OR

- c) For the following given transaction data-set generate frequent pattern using apriori algorithm support = 50% and confidence = 75% [5]

Transaction ID	Items purchased
1	Chilli, Lemon, Carrot, Beet
2	Chilli, Lemon, Beet
3	Chilli, Cucumber, Cabbage
4	Chilli, Beet, Cucumber
5	Lemon, Beet, Cucumber

- d) Consider the same data set in Q.4 (c) and calculate the support and confidence of following rules. [5]

- i) {Chilli, lemon} → {Beet}
- ii) {Cucumber} → {Beet}
- iii) {Chilli, Cucumber} → {Cabbage}
- iv) {Beet, Lemon} → {Chilli}
- v) {Lemon, Carrot} → {Chilli}

Q5) a) Apply k-means clustering algorithm on the data set of temperature in celsius. **[5]**

$D = \{16, 40, 23, 32, 17, 18, 9, 8, 7, 33, 25, 27, 13, 19, 26, 42, 44, 6, 11, 10\}$

Where $k = 2$

b) Write a short note on divisive clustering mechanism. **[5]**

OR

c) Form 2 clusters for the given data set. **[5]**

$D = \{25\%, 40\%, 35\%, 60\%, 65\%, 70\%, 72\%, 73\%, 45\%, 28\%, 52\%, 58\%, 90\%, 93\%, 81\%, 32\%, 89\%, 61\%, 39\%, 95\%\}$

Apply k - means algorithm.

d) Write a short note on sum classification. **[5]**



Total No. of Questions :5]

SEAT No. :

PE1977

[Total No. of Pages : 2

[6554]-303

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

IT 33 : SOFTWARE TESTING AND QUALITY ASSURANCE

(Revised 2020 Pattern) (Semester-III)

Time : 2 ½Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) Write a detailed test plan for a shopping website which sells all home appliances to the customer. The Customer should be able to register & login in the application. The application should support various hardware & software platform. It should be able to handle large number of users various vendors can sell their products online through this application. The payment gateway is developed by the third party vendor. **[10]**

OR

Write detailed test cases for login page of online banking application. **[10]**

Q2) a) Define SQA. Also explain building blocks of SQA. **[5]**

b) Define quality. Explain process & product metrics in detail. **[5]**

OR

a) Define SQA planning & standards. **[5]**

b) Define software reliability. Explain reliability measurement factors in detail. **[5]**

P.T.O.

- Q3)** a) Define testing. Explain 7 testing principles in detail. [5]
b) Explain agile testing in detail. [5]

OR

- a) Define software testing life cycle. [5]
b) State & explain non-functional testing types. [5]

- Q4)** a) What is mutation & data flow-based testing? [5]
b) Explain white box testing & its different techniques statement, branch, path & decision coverage. [5]

OR

What is a review process? Explain inspection process & its various roles in detail. [10]

Q5) Write short notes on. (Any 2) [2×5=10]

- a) CAST
b) Selenium
c) J meter



Total No. of Questions : 5]

SEAT No. :

PE1978

[Total No. of Pages : 3

[6554]-304

Second Year M.C.A. (Management)

**IT - 34 : KNOWLEDGE REPRESENTATION & ARTIFICIAL
INTELLIGENCE - ML, DL**

(2020 Pattern) (Semester - III) (Revised)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Use of scientific calculator is allowed.*
- 3) *Figures to the right indicate full marks.*

- Q1) a)** Explain different types of knowledge representation schemes used in AI. **[5]**
b) Difference between Machine Learning & Statistical Learning. **[5]**

OR

- c) Explain the role of AI in real life applications. **[5]**
d) Explain types of Machine Learning. **[5]**

- Q2) a)** Using the following statements. **[6]**

p : I will study machine learning

q : I will go to a movie

r : I am in a good mood

Write the following statements in symbolotic form

- i) If I am not in a good mood, then I will go to a movie
 - ii) I will not go to a movie and I will study machine learning
 - iii) If I will not study machine learning, then I am not in a good mood.
- b) Test the validity of the following statement if I leave college then I'll get a job in a bank. I am not leaving college so I won't get a job in a bank. **[4]**

OR

P.T.O.

c) Translate following sentences in FOL. [6]

- i) Some physical objects are houses
- ii) Every student who loves God is happy
- iii) Anyone who loves everyone loves himself.
- iv) No one can solve every problem.
- v) Someone walks and someone talks
- vi) Everyone is loyal to someone

d) Find the tautology for the following. [4]

- i) $(p \wedge q) \wedge \neg (p \vee q)$
- ii) $(p \rightarrow q) \leftrightarrow (q \vee \neg q)$

Q3) a) Use Naive Bayes 4 solve the following. If whether is sunny, then player should play or not. [6]

Sr. No.	Outlook	Play
1	Rainy	Yes
2	Sunny	Yes
3	Overcast	Yes
4	Overcast	Yes
5	Sunny	Yes
6	Rainy	Yes
7	Sunny	No
8	Overcast	Yes
9	Rainy	No
10	Sunny	No
11	Sunny	Yes
12	Rainy	No
13	Overcast	Yes
14	Overcast	Yes

b) Explain confusion matrix in detail. [4]

OR

- c) Apply kNN Classification algorithm for the given dataset & predict the class for $X(p_1 = 3, p_2 = 7)$ ($k = 3$) [6]

P_1	P_2	Class
7	7	False
7	4	False
3	4	True
1	4	True

- d) Explain framework of data analysis with suitable example. [4]

- Q4) a)** By using the given input & kernel, perform the convolutional mapping. [10]

-5	3	2	-5	3
4	3	2	1	-3
1	0	3	3	5
-2	0	1	4	4
5	6	7	9	-1

INPUT

0	-1	0
-1	5	-1
0	-1	0

KERNEL

OR

- b) Use the following table (Document D) [10]

	W_0	W_1	W_2	W_3	W_4	W_5
r_0	2	0	0	1	0	1
r_1	1	2	3	0	1	2
r_2	0	0	0	1	1	1
r_3	1	5	6	0	0	1
r_4	1	0	1	0	1	0

Find i) IDF (w_0, D) and TF-IDF (r_3, w_3)

ii) IDF (w_1, D) and TF-IDF (r_4, w_2)

- Q5) a)** Explain types of RNN [5]

- b) Write short note on Image processing. [5]

OR

- c) Explain Deep learning problem types. [6]

- d) Write short note on data center. [4]



Total No. of Questions : 5]

SEAT No. :

PE1979

[Total No. of Pages : 2

[6554]-305

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

IT 35 : CLOUD COMPUTING

(Revised 2020 Pattern) (Semester - III)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) a) Difference between Cloud Vs Grid computing. **[5]**

b) Explain the difference between the IAAS, PAAS, & SAAS. **[5]**

OR

a) Define the cloud deployment models. **[5]**

b) Write short notes on a AWS cloud services. **[5]**

Q2) a) Explain the Types of virtualization. **[5]**

b) Explain the Type-1 and Type-2 Hypervizer. **[5]**

OR

a) Explain the full virtualization. **[5]**

b) Write short note on a machine Image. **[5]**

P.T.O.

Q3) What do you mean by cloud Governance. Explain Important of cloud Governance. **[10]**

OR

Write short note on a

- a) SOA (Service Oriented Architecture)
- b) SLA (Service Level Agreement)

Q4) Explain Edge computing with suitable Diagram. **[10]**

OR

How multi-core processor is important for implementation in any system with example.

Q5) Explain the various security issue in cloud, also Explain how privacy and security can be achieved in cloud. **[10]**

OR

What steps should be taken to maintain regulatory compliance when migrating to cloud with Banking and Financial Services.

x x x

Total No. of Questions : 5]

SEAT No. :

PE1980

[Total No. of Pages : 2

[6554]-401

Second Year M.C.A. (Management)

421 - IT 41 : DEVOPS

(Revised 2020 Pattern) (Semester - IV)

Time : 2½ Hours]

[Max. Marks : 50

Instructions to the candidates:

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

- Q1)** a) What is DevOps? Discuss the need of DevOps. [5]
b) What is git commit? Explain git commit with example. [5]

OR

- c) Explain any 5 Linux commands with suitable example. [5]
d) What is branching in git? Explain with suitable example. [5]

- Q2)** a) Create organisation, add yourself and node to organisation in chef configuration management. [10]

OR

- b) Explain Maven local and global repositories in detail with steps. [10]

- Q3)** a) What is Docker hub? Explain running commands in container. [5]
b) Explain docker networking. [5]
i) Accessing containers
ii) Container Routing

OR

- c) Write commands for creating a custom image and running a container from the custom image in docker. [5]
d) Explain docker components with suitable block diagram. [5]

P.T.O.

Q4) a) Explain databags in chef. [5]

b) Explain Maven dependencies. [5]

OR

c) Explain push based design approach of chef. [5]

d) What Maven POM builds. [5]

Q5) a) Differentiate between Agile and DevOps. [5]

b) Explain the various stages of files in git. [5]

OR

c) Explain environment variables in Linux. [5]

d) What is version control system in git? Explain its types. [5]



Total No. of Questions :5]

SEAT No. :

[Total No. of Pages : 2

PE1981

[6554]-402

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

422-BM41: PPM & OB

(Revised 2020 Pattern) (Semester-IV)

Time :2 ½ Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) XYZ Corporation is a medium- sized manufacturing company that produces Consumer electronics. The company has been facing several challenges, including declining efficiency, low employee morale and increased competition. As a member of leadership team recognize and discuss different managerial functions to address these issues. **[10]**

OR

Being a Project Manager of an IT company describe need, process of management, also discuss different managerial skills. **[10]**

Q2) a) Mr. Sham is a CEO of a big production organization. Being head of organization analyse decision making under certainty and under uncertainty **[5]**

b) Define Henry Fayl's principles of management. **[5]**

OR

a) Compare individual and group decision making in detail. **[5]**

b) Assume you are the investor in stock market, analyse the decision making under risk while selecting different insurance policies and give solution for the same. **[5]**

P.T.O.

Q3) Describe Herbert Simon's Model & Principle of Rationality with example.[10]

OR

Assume you are the head of the department and some employees are not Satisfied due to work pressure, target and promotion. Being head how you can Apply Herzberg's motivation-hygiene theory and come with proper solution. [10]

Q4) What is Theory X and Y, Theory Z? How it is useful discuss it in detail with example? [10]

OR

Explain stages of conflict process and how it work in organization. Also describe determinants of Personality. [10]

Q5) Describe various sources & types of stress along with the techniques to resolve the stress. [10]

OR

Describe Johari window in detail with suitable example. [10]

