Total No. of Questions : 5]

SEAT No. : ____

PD-1677

[Total No. of Pages : 2

[6432]-1

M.C.A. (Management)

IT11 : JAVA PROGRAMMING

(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) Define abstract class? overides the methods of abstract class with suitable example. **[7]**

b) Write note on 'Static Keyword'. **[3]**

OR

c) Demonstrate how to achieve multiple inheritance mechanism using interface? **[7]**

d) Differentiate between shallow copy and Deep copy. **[3]**

Q2) a) Explain user defined exception with suitable example. **[5]**

b) Differentiate between string buffer and string builder. **[5]**

OR

c) Explain thread synchronization with suitable example. **[5]**

d) Differentiate between throw and throws. **[5]**

Q3) a) Defined linkedlist? Explain how to remove an element from linked list with suitable example. **[6]**

b) Write short note on characteristic of array list. **[4]**

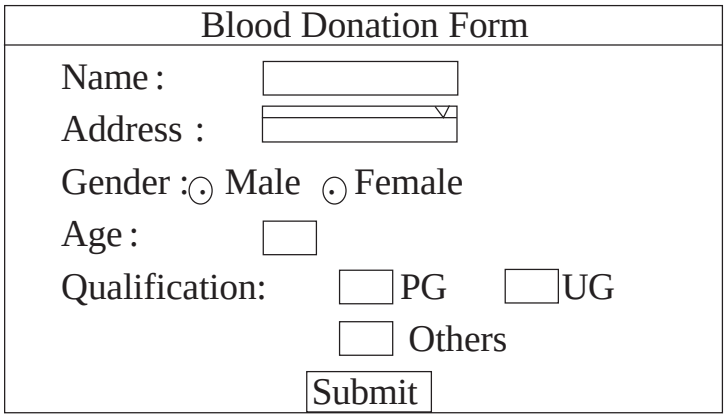
OR

c) Explain insert and delete operation in vector. **[6]**

d) Differentiate between array and arraylist. **[4]**

P.T.O.

Q4) a) Design following GUI using AWT components. **[10]**



OR

b) Demonstrate mouselistner interface with suitable example. **[10]**

Q5) a) Create table "EMPLOYEE" with fields (Emp-id, Emp-name, Emp-salary). Perform insertion and deletion operation through Java appliactions into database:

(Consider necessary assumptions.) **[10]**

OR

b) Create a web page using servelet to accept number from user and display number is odd or even. **[10]**

Total No. of Questions : 5]

SEAT No. :

PD-1678

[Total No. of Pages : 3

[6432]-2

M.C.A. (Management)

IT12 : DATA STRUCTURE AND ALGORITHMS

(2020 Revised Pattern) (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 implement deletion of node from specific position in doubly linked list. **[6]**

b) Write an algorithm to copy element from stock to queue. **[4]**

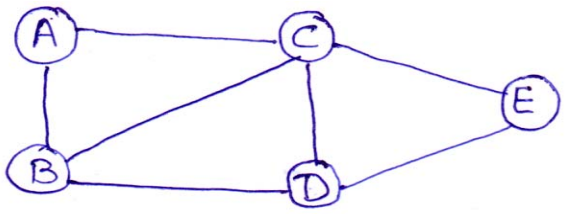
OR

c) Write an algorithm to calculate average of nodes data in singly linked list. **[6]**

d) Explain need of circular queue. **[4]**

Q2) a) Construct a Binary search tree for the following data. 46,16,80,91,11,56,13,21,50. Delete 46 from BST and reconstruct the binary search tree. **[6]**

b) Write adjacency list and BFS for following Graph. (Starting vertex : A) **[4]**



OR

c) Construct AVL tree for the following sequence of numbers. 50,20,60,10,8,15,65. **[6]**

d) Explain MAX heap with suitable example. **[4]**

P.T.O.

Q3) a) Apply the rain terrace algorithm to the following problem Input : [4,3,0,2,0,2,3] Draw the figure and find the solution. **[6]**

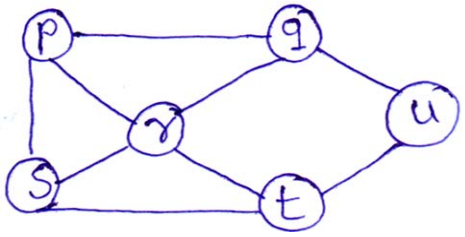
b) Explain power set with suitable example. **[4]**

OR

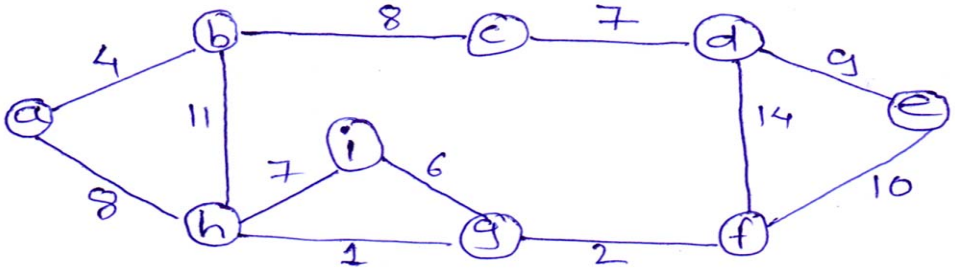
c) Apply the maximum subarray algorithm to the input :

arr = [– 2, 1, – 3, 4, – 1, 2, 1, – 5, 4] and find sum of maximum sub array. **[6]**

d) Find the Hamiltonian cycle from following graph. **[4]**



Q4) a) Apply kruskal's algorithm to obtain minimum cost spanning tree for the following graph. **[6]**



b) Explain Pascal Triangle. **[4]**

OR

c) Sort the following data using quick sort [15, 85, 35, 90, 40, 50, 70] **[6]**

d) Compare quick sort and merge sort. **[4]**

Q5) a) Find the length of longest common subsequence for following string using dynamic programming. **[7]**

S1 = ABCAB

S2 = AECB

b) Explain Integer partition. **[3]**

OR

c) Consider the instance of 0/1 knapsack problem n = 3, m = 6, w = (2, 3, 4), p = (1, 2, 5) using dynamic programming. Determine the optimal profit and the solution vector. **[7]**

d) Explain unique path. **[3]**

Total No. of Questions : 5]

SEAT No. :

PD1679

[Total No. of Pages : 2

[6432]-3

First Year M.C.A. (Management)

IT-13: OBJECT ORIENTED SOFTWARE ENGINEERING

(Revised 2020 Pattern) (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 prototyping model for software system development. **[5]**

b) Explain agile process model - Extreme programming (xp). **[5]**

OR

a) Explain user's roles and their responsibilities in SDLC. **[5]**

b) Explain agile process model - crystal. **[5]**

Q2) Write Software Requirement Specification (SRS) as per IEEE template for the scenario of Poultry Farming System (PFS). This system having below functionalities as- **[10]**

a) Poultry details registration

b) Sanitation and hygiene details capturing

c) Proper feed & water supply information

d) Daily eggs production capturing

OR

Write a Software Requirement Specification (SRS) as per IEEE template for automobile manufacturing industries Employee Management System (EMS). **[10]**

Q3) Draw use case diagram and class diagram for developing a system for managing a restaurant's table reservation and food orders. **[10]**

OR

Draw Activity diagram and sequence diagram for BHIM UPI transaction processing system. **[10]**

P.T.O.

Q4) a) Draw the user interface screen for providing student feedback for teaching faculty and infrastructure facilities for the Institute. **[5]**

b) Draw collaboration diagram for online booking of movie tickets for metro multiplex. **[5]**

OR

a) Draw the user interface screen for agriculture exhibition visit gatepass generation. **[5]**

b) Draw state transition diagram for cybercrime complaint registration. **[5]**

Q5) Write a short note on (Any 2) **[2×5=10]**

a) Class and object

b) Association and links

c) Feature Driven Development (FDD)

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Total No. of Questions : 5]

SEAT No. : ____

PD-1680

[Total No. of Pages : 2

[6432]-4

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

IT-14: Operating System Concepts

(Rev. 2020) (Semester - I)

Time : 2½ Hours] ***[Max. Marks : 50***

Instructions to the candidates :

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

Q1) a) What is CPU state? Explain the role of CPU state in scheduling the process. **[5]**

b) What is deadlock? Explain the necessary conditions for its occurrence and how deadlock can be detected. **[5]**

OR

a) What is memory management? Explain memory management Technique in detail. **[5]**

b) Explain process control block. **[5]**

Q2) What is mobile operating system? Explain types and advantages of mobile operating system with examples. **[10]**

OR

Explain following : **[10]**

i) Distributed operating system

ii) Types of Microprocessor

Q3) a) What is RTOS? Explain the components and characteristics of RTOS. **[5]**

b) Explain LINUX file structure in detail. **[5]**

OR

a) What is Embedded OS? Explain the features of it in detail. **[5]**

b) Explain the overview of control panel in Windows OS. **[5]**

P.T.O.

Q4) a) Write a shell script program for factorial using following number. **[5]**

b) Describe any 5 commands of Linux. **[5]**

OR

a) Write a shell program to add two numbers using function. **[5]**

b) Explain different types of variables using shell script. **[5]**

Q5) Write short note [Any Two]: **[10]**

a) CPU scheduling Algorithms.

b) Overview of LINUX Kernel.

c) Demand Paging

d) Uniform Memory Access (UMA)

Total No. of Questions : 5]

SEAT No. : ____

PD-1681

[Total No. of Pages : 2

[6432]-5

M.C.A. (Management)

IT-15: Network Technologies

(2020 Pattern) (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 any four networking devices in details. **[4]**

b) Compare OSI Model vs TCP/IP model. **[6]**

OR

a) Compare Connection Oriented N/Ws Vs Connectionless N/Ws. **[4]**

b) Explain TCP/IP model in detail. **[6]**

Q2) a) Draw and explain IP addressing schemes. **[4]**

b) Generate CRC code for the data word: 101010001 using the divisor 11001. **[6]**

OR

a) For the given Class-C IP address - 192.168.17.224 and subnet mask 255.255.225.240. Calculate **[4]**

i) Total no of subnets

ii) Total no. of Host IPs/subnets

iii) Total no. of Valid Host IPs/subnets

iv) First and Last Valid Host IPs/subnets

b) Describe any two Error - detection techniques **[6]**

P.T.O.

Q3) a) Find the maximum number of Hosts available on Class-B IP address with subnet mask 255.255.255.192. Also, find the maximum number of subnets available. **[4]**

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

OR

a) Draw and explain IPV6 packet format. **[4]**

b) Detect if there is error in the received Hamming code 1010111001100 with even parity. **[6]**

Q4) a) Explain passive attacks. **[4]**

b) What is DHCP? Explain mechanism of DHCP Client, DHCP server, DHCP scope resolution. **[6]**

OR

a) What is asymmetric key cryptography? **[4]**

b) Write any two email protocols in detail **[6]**

Q5) a) Explain with an example Routing Information Protocol (RIP) **[4]**

b) Write the client and server program for implementing the broadcasting in the local network. **[6]**

OR

a) What is IP Routing? Mentioned all Types of routing protocol. What is the concept of Routing Table? **[4]**

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

Total No. of Questions : 5]

SEAT No. :

PD-1682

[Total No. of Pages : 3

[6432]-11
M.C.A.
MANAGEMENT
IT21 : Phyton Programming
(2020 Revised) (Semester - II)

Time : 2½ Hours] ***[Max. Marks : 50***

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Draw neat labeled diagrams wherever necessary.***
3) ***Assume suitable data if necessary.***

Q1) a) Write a program to create the separate list of digits from the original list, which contains digits and alphabets using list comprehensions. **[5]**

Input list = ['a', 'b', 2, 43, 'Hi', 900, 'xyz'].

output list = [2, 43, 900]

b) What are the prime factors to consider when dividing a program into modules? **[5]**

OR

c) Explain Anonymous function with suitable example. **[5]**

d) Input Any Five integers (+ ve and – ve). Write a python code to find the sum of negative numbers, positive numbers and print them. **[5]**

Q2) a) What is multi threading? How to implement multithreading, give suitable example. **[5]**

b) Write user defined exception program which will find the factorial of a number if number is less than zero it should raise the exception as "invalid input" **[5]**

OR

c) Why do we use synchronization in thread? Justify Answer with suitable example. **[5]**

d) Create a program that opens a file named "output txt" for writing and prompts the user to enter a sentence write the sentence to the file and close it. **[5]**

P.T.O.

Q3) a) Write a program to validate ABC ID (Academic Bank of Credits) using regular Expression. **[5]**

b) Write a program to create a class called complex and implement _add_ ( ) method to add two Complex Numbers. **[5]**

OR

c) Write a program to validate PAN Card using regular expression. **[5]**

d) Explain static keyword in python how constructer can be used in inheritance. **[5]**

Q4) a) Write a python program using mongo DB database to create a collection "Store" with fields (s_ id, s_ brand name age_group, prize). **[5]**

Perform the following operations

i) Display all brands in "kids" group

ii) Update prize with new amount

b) What do you understand by mutability? Discuss with suitable example.**[5]**

OR

c) Write a program to demonstrate the scope of variables. **[5]**

d) Write a python program using mongoDB database to create a collection "Table Tennis Tournaments" with fields (Player-id, P_name, age, mobile_no) and display all players list. **[5]**

Q5) a) Create a series from numpy array and find max and mean of unique items of series. **[5]**

b) Create a pandas data frame using CSV file and perform a following. **[5]**

i) Display 5 first row.

ii) Display list of all columns.

OR

c) Draw line graph using matplot lib and decorate it by adding various elements use suitable data. **[5]**

d) Given a data frame df in pandas as below **[5]**

Id	First name	Last name	Age
01	Ravi	Sharma	25
02	Ajay	Varma	30
03	Vijay	kulkarni	26
04	Krish	Patil	22
05	Rahul	Raj	18

i) Compute mean of age.

ii) Display all column names.

iii) Compute maximum age of person.

Total No. of Questions : 5]

SEAT No. :

PD-1683

[Total No. of Pages : 3

[6432]-12
M.C.A.
MANAGEMENT
IT22 : SOFTWARE PROJECT MANAGEMENT
(2020 Revised) (Semester - II)

Time : 2½ Hours] ***[Max. Marks : 50***

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***Draw neat labeled diagrams wherever necessary.***
3) ***Basic calculator is allowed.***

Q1) a) UK based KPO company working on "Licence Management System". They are using number of expensive & licenced software tools. More than 5000 team members are sharing these tools. you have been deputed as project manager to ensure that a project finishes within original budged, with the required Scope of work & within the required timescales, and to ensure that throughout this process all the state holders, especially the client are satisfied with the project results. Prepare risk management process based on below points. **[6]**

i) Risk identification ii) Risk analysis iii) Risk mitigation

b) Explain the benefits of Aglie project management in brief. **[4]**

OR

c) A large construction company "PCL Developers" engaged in the real estate construction business decided to develop an ERP through Bistha Softech. The output of the system will be a cost sheet detailing the relevant information for contracting, budgeting, process monitoring and bill payment. Bistha softech team has no domain knowledge, as a project manager, you have been asked to suggest a risk management strategy after identifying the risks solve the case study. **[6]**

d) Explain Github. **[4]**

Q2) a) Explain sprint retrospective in detail. **[6]**

b) Write a short note on over view of project management framework. **[4]**

P.T.O.

OR

c) Consider project with following functional unit. **[6]**

i) Number of user inputs = 40

ii) Number of user outputs = 30

iii) Number of user enquiries = 25

iv) Number of user files = 04

v) Number of External interfaces = 04

In addition to above system requires

a) Significant data communication (4)

b) Performance is very critical (5)

c) Designed code may be moderately reusable (2)

d) System is not designed for multiple installation (0)

other complexity factors are treated as Average. Compute function point for project.

d) Short note on capability maturity model. **[4]**

Q3) a) A project of 200 KLOC is to be developed. software development team has average experience on similar type of projects. The project schedule is not very right. Calculate the effort, development time, average staff size of the project by using semi-detached mode of cocomo model. **[6]**

b) Explain Agile project management life cycle. **[4]**

OR

c) Scenario user wants to request cash from his/her account at any ATM

i) Write user story for the scenario above.

ii) Write an acceptance criterion for the user story in given/when/then format. **[6]**

d) Explain planning poker story point estimation technique. **[4]**

Q4) a) Explain the process to plan & execute iteration in agile with suitable example. **[6]**

b) Write short note on role of project manager. **[4]**

OR

c) Explain the roles of scrum master, product owner & development team. **[6]**

d) Short note on software configuration management. **[4]**

Q5) a) List out the 5 software project risks and explain the strategies for reducing these risks. **[6]**

b) Explain Agile manifesto & Agile principles. **[4]**

OR

c) Explain risk identification, analysis & mitigation in brief. **[6]**

d) Differentiate : Agile project management v/s Traditional project management. **[4]**

Total No. of Questions : 5]

SEAT No. :

PD1684

[Total No. of Pages : 2

[6432]-13

First Year M.C.A. (Management Faculty)
IT-23: ADVANCED INTERNET TECHNOLOGIES
(Revised 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.***
3) ***Draw neat and labelled diagrams wherever necessary.***

Q1) a) Explain types of CSS? Elaborate it using internal CSS with example. **[5]**

b) Write a program using <SVG> tag to draw line, rectangle and triangle shapes. **[5]**

OR

c) Describe <video> tag with all its properties of with example. **[5]**

d) Write a program by using CSS property Font, Text & Color. **[5]**

Q2) a) Write a program in Node JS to perform file CRUD operations by using fs module. **[5]**

b) What is Node. js? Explain its working and features. **[5]**

OR

c) What are the different types of modules in Node JS? **[5]**

d) Write a program in Node JS using event handling to perform all basic arithmetic operations. **[5]**

Q3) a) What is data binding in Angular? Explain with example. **[5]**

b) Create an angular program which will demonstrate the usage of ng for directive. **[5]**

OR

c) What are the different services in Angular? **[5]**

d) Explain Angular project directory structure in detail. **[5]**

P.T.O.

Q4) a) Write a PHP script to design a form for exam registration. Insert 5 records in database and display all the inserted records on new page. (Assume suitable table structure) **[10]**

OR

b) Explain static, local and global variables in PHP with suitable example. **[5]**

c) Explain all array sorting methods in PHP with suitable example. **[5]**

Q5) Write short note (Any two) **[10]**

a) NPM

b) Type Script in Angular

c) Cookies in PHP

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Total No. of Questions : 5] **SEAT No. :**

PD-1685 **[Total No. of Pages : 2**

[6432]-14

M.C.A.-I (MANAGEMENT)

IT-24: Advance 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) The owners of a small computer repair shop would like to keep track of the repair jobs for computers they repair, the items used for each repair job, the labor costs for each repair job, the repairmen performing each repair job and the total cost of each repair job.
When customers bring their computer in to be repaired, they make a deposit on the repair job and are given a date to return and uplift their computer. Repairman then perform repairs on the computers based on the repair job and detail the labor cost and the items used for each repair job.
When computers return they pay the total cost of the repair job less deposit, collect a receipt for their payment and uplift the repaired computer using this payment receipt.
Draw ERD & design proper table structure. **[8]**

OR

What is Normalization? Explain Normalization process upto 3NF with suitable Example. **[8]**

Q2) a) What is DBMS? Explain its characteristics. **[5]**
b) Explain characteristics of object oriented database. **[5]**

OR

a) Explain Architecture of DBMS. **[5]**
b) What is Mobile Database? Explain features, limitations of mobile database. **[5]**

P.T.O.

Q3) a) Explain any one technique to recover database using Log Based Recovery. **[5]**

b) Differentiate between DAC of MAC. **[5]**

OR

a) What is database Backup? Explain various types of Backup. **[5]**

b) Discuss various database security issues. **[5]**

Q4) a) Check whether the schedule S is conflict serializable are not S : $W_1(B)$, $R_2(A)$, $W_2(A)$, $W_2(B)$, $R_3(A)$, $R_3(B)$, $R_4(A)$, **[6]**

b) Explain the need of NOSQL. **[2]**

OR

a) Explain conflict and view serializability with suitable example. **[6]**

b) State the types of NOSQL Database. **[2]**

Q5) a) What do you mean by inter-query and intra-query Parallelism. **[7]**

b) Explain various distributed data storage strategies with suitable example. **[7]**

OR

a) Explain data partitioning techniques in parallel databases with example. **[7]**

b) Explain 2 & 3 phase commit Protocal in the distributed Databases. **[7]**

Total No. of Questions : 5]

SEAT No. :

PD1686

[Total No. of Pages : 4

[6432]-15
First Year M.C.A. (Management)
MT - 21 : OPTIMIZATION TECHNIQUES
(Revised 2020 Pattern) (Semester-II)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

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

Q1) Use the simplex method to solve the following LP problem. **[10]**

Maximize $Z = 3x_1 + 5x_2 + 4x_3$ Subject to the constraints

$2x_1 + 3x_2 \le 8,$

$2x_2 + 5x_3 \le 10,$

$3x_1 + 2x_2 + 4x_3 \le 15$ and $x_1, x_2, x_3 \ge 0$

OR

Solve the following L.P.P. by two-phase method **[10]**

Maximize $Z = 4x + 3y$ Subject to the constraints

$2x + 3y \le 6$

$3x + 1y \ge 3$ Both x and y all ≥ 0

Q2) a) Two manufacturers A and B are competing with each other in a restricted market. Over the year, A's customers have exhibited a high degree of loyalty as measured by the fact that customers are using A's product 80 per cent of the time. Also former customers purchasing the product from B have switched back to A's product 60 per cent of the time. **[7]**

i) Construct and interpret the state transition matrix in terms of (1) retention and loss, and (2) retention and gain

ii) Calculate the probability of a customer purchasing A's product at the end of the second period.

b) Explain the any one quantitative method that is useful for decision-making under uncertainty with example. **[3]**

OR

P.T.O.

a) A bakery keeps stock of a popular brand of cake. Previous experience shows the daily demand pattern for the item with associated probabilities, as given below: **[7]**

Daily demand (number)	:	0	10	20	30	40	50
Probability	:	0.01	0.20	0.15	0.50	0.12	0.02

Use the following sequence of random numbers to simulate the demand for next 10 days.

Random numbers : 25, 39, 65, 76, 12, 05, 73, 89, 19, 49.

Also estimate the daily average demand for the cakes on the basis of the simulated data.

b) Explain the following essential components of decision model : **[3]**

- Decision alternatives
- States of nature
- Payoff

Q3) a) A readymade garments manufacturer has to process 7 items through two stages of production, viz., cutting and sewing. The time taken for each of these items at the different stages are given below in appropriate units:**[7]**

Item	:	1	2	3	4	5	6	7
Process time Cutting	:	5	7	3	4	6	7	12
Sewing	:	2	6	7	5	9	5	8

Find an order in which these items are to be processed through these stages so as to minimize the total processing time.

b) ABC Corporation wants to launch one of its mega campaigns to promote a special product. The promotion budgets not yet finalized, but they know that some Rs. 55,00,000 is available for advertising and promotion.

Management wants to know how much they should spend for television spots, which is the most appropriate medium for their product. They have created five 'T.V. campaign strategies' with their projected outcome in terms of increase in sales. Find which one they have to select to yield maximum utility. The data required is given below. **[3]**

Strategy	Cost in lakhs in Rs.	Increased in sales in lakhs of Rs.
A	1.80	1.78
B	2.00	2.02
C	2.25	2.42
D	2.75	2.68
E	3.20	3.24

OR

a) A machine operator has to perform three operations, namely plane turning, step turning and taper turning on a number of different jobs. The time required to perform these operations in minutes for each operating for each job is given in the matrix given below. Find the optimal sequence, which minimizes the time required. **[7]**

Job	Time for plane turning in minutes	Time for step turning in minutes	Time for taper turning in minutes
1	3	8	13
2	12	6	14
3	5	4	9
4	2	6	12
5	9	3	8
6	11	1	13

b) In a game of head and tail of coins the player A will get Rs. 4/- when a coin is tossed and head appears; and will lose Rs. 5/- each time when tail appears. Find the optimal strategy of the player. **[3]**

Q4) A small project is composed of 7 activities whose time estimates are listed below. Activities are being identified by their beginning (i) and ending (j) node numbers. **[10]**

Activities		Time in weeks		
i	j	t_0	t_1	t_p
1	2	1	1	7
1	3	1	4	7
1	4	2	2	8
2	5	1	1	1
3	5	2	5	14
4	6	2	5	8
5	6	3	6	15

a) Draw the network

b) Calculate the expected variances for each

c) Find the expected project completed time

d) Calculate the probability that the project will be completed at least 3 weeks than expected

e) If the project due date is 18 weeks, what is the probability of not meeting the due date

OR

The utility data for a network are given below. Determine the total, free, independent and interfering floats and identify the critical path. **[10]**

Activity :	0-1	1-2	1-3	2-4	2-5	3-4	3-6	4-7	5-7	6-7
Duration :	2	8	10	6	3	3	7	5	2	8

Q5) a) Solve the given game by method of matrices: **[7]**

		B		
		I	II	III
A	I	1	–1	–1
	II	–1	–1	3
	III	–1	2	–1

b) An investor is given the following investment alternatives and percentage rates of return. **[3]**

	States of Nature (Market Conditions)		
	Low	Medium	High
Regular shares	7%	10%	15%
Risky shares	–10%	12%	25%
Property	–12%	18%	30%

Over the past 300 days, 150 days have been medium market conditions and 60 days have had high market increases. On the basis of these data, state the optimum investment strategy for the investment.

OR

a) A company is currently involved in negotiations with its union on the upcoming wage contract. Positive signs in table represent wage increase while negative sign represents wage reduction. What are the optimal strategies for the company as well as the union? What is the game value? **[7]**

Conditional costs to the company (Rs. in lakhs)

		Union Strategies			
		U_1	U_2	U_3	U_4
Company Strategies	C_1	0.25	0.27	0.35	–0.02
	C_2	0.20	0.06	0.08	0.08
	C_3	0.14	0.12	0.05	0.03
	C_4	0.30	0.14	0.19	0.00

b) A manufacturer, manufactures a product, of which the principal ingredient is a chemical X. At the moment, the manufacturer spends Rs. 1,000 per year on supply of X, but there is a possibility that the price may soon increase to four times its present figure because of a worldwide shortage of the chemical. There is another chemical Y, which the manufacturer could use in conjunction with a third chemical Z, in order to give the same effect as chemical X. Chemicals Y and Z would together cost the manufacturer Rs. 3,000 per year, but their prices are unlikely to rise. What action should the manufacturer take using minimax criteria for decision-making? **[3]**

Total No. of Questions : 5]

SEAT No. :

PD1687

[Total No. of Pages : 2

[6432]-21
S.Y.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) ***Draw neat labelled diagram wherever necessary.***

Q1) a) Explain Android architecture with Diagram. **[10]**

OR

b) Explain Windows mobile application architecture with Diagram. **[10]**

Q2) a) Write an Android code to design simple calculator with two textfields and four buttons for four basic mathematical operations. **[10]**

OR

b) Create an android application to show alert dialog with title delete message "Are you sure to delete" and yes and no button. **[10]**

Q3) a) Explain XML parsing in an Android application development. **[5]**

b) Write an android code to turn on/off Geo-location. **[5]**

OR

c) Explain web service with suitable example. **[5]**

d) Explain View and View Groups in Android. **[5]**

P.T.O.

Q4) a) Write an SQlite code for taking appointment in Hospital. Consider suitable details of patient. After successful registration, patient will get appointment id. **[10]**

OR

b) Write firebase code to insert cosmetic items in cosmetic table. Finally list out all cosmetic items. **[10]**

Q5) a) What is ListView and describe its use in React Native? **[5]**

b) Write flutter code to display unread sms. **[5]**

OR

Write short note on (Any 2)

a) Write the advantages of using flutter. **[10]**

b) Web View.

c) React Native.

Total No. of Questions : 5]

SEAT No. :

PD-3922

[Total No. of Pages : 3

[6432]-22R

S.Y. M.C.A.

MANAGEMENT

IT - 32 : Data Warehousing and Data Mining

(Rev. 2020) (Semester - III)

Time : 2½ Hours] ***[Max. Marks : 50***

Instructions to the candidates:

1) ***All questions are compulsory.***

2) ***Draw neat labelled diagram wherever necessary.***

Q1) a) Explain the Kimball life cycle of Data Warehouse with neat diagram. **[5]**

b) Describe various schemas in Data Warehouse. **[5]**

OR

c) Compare ROLAP, MOLAP & HOLAP. **[5]**

d) What is meta data & Explain the types of meta data. **[5]**

Q2) a) Define Data reduction & Describe the process in data reduction. **[5]**

b) Explain various data transformation. **[5]**

OR

c) Specify ETL extraction methods in detail. **[5]**

d) Discuss ETL process in detail. **[5]**

Q3) a) What is data mining? Explain Data mining process in detail. **[5]**

b) Differentiate Web mining & Data mining. **[5]**

OR

c) Define Test mining. Enlist the steps used in test mining process. **[5]**

d) Explain different operations of OLAP. **[5]**

P.T.O.

Q4) a) Write Apriori Algorithm and find the association role for the given problem **[5]**

TID	Item set
T_1	*x,y*
T_2	*y,w*
T_3	*y,z*
T_4	*x,y,w*
T_5	*x,z*
T_6	*y,z*
T_7	*x,z*
T_8	*x,y,z,w*
T_9	*x,y,z*

Note : Consider minimum support = 2 & confidence = 50%

b) Consider the same data set in Q. 4 a) and calculate support and confidence of the following roles. **[5]**

i) $\{x,y\} \rightarrow \{z\}$

ii) $\{x,\} \rightarrow \{w\}$

iii) $\{y\} \rightarrow \{z\}$

iv) $\{x\} \rightarrow \{z\}$

v) $\{x,y\} \rightarrow \{w\}$

OR

c) Apply KNN algorithm for the given dataset and predict the class of new instance where Brightness = 25 and saturation = 40. **[5]**

Brightness	Saturation	Class
45	25	Black
55	55	Pink
65	95	Pink
15	30	Black
75	75	Pink
65	15	Black
30	85	Pink

Note : Assume K = 5

d) What is decision tree? Generate Decision tree for classification of Employee promotion (Yes/No) based on the below attributes. **[5]**

i) Gender

ii) Experience

iii) Certification

Q5) a) Consider the given dataset and convert it in to two clusters. (Apply k -means algorithm). **[5]**

Dataset D = {12, 8, 9, 10, 5, 13, 21, 19, 31, 23, 45, 67, 24, 7, 2, 1, 29, 36, 37, 28}.

b) What is Clustering? Explain different methods of clustering. **[5]**

OR

c) Group the visitors of abc.com website using their age. (Apply k-means algorithm to form two clusters) **[5]**

Data set D = {15, 14, 16, 17, 18, 20, 21, 22, 65, 61, 60, 44, 43, 40, 41, 42, 35, 28, 19, 31}.

d) Explain dimensional modeling. **[5]**

Total No. of Questions : 5]

SEAT No. :

PD-1689

[Total No. of Pages : 2

[6432]-23
S.Y. M.C.A. (Management)
IT33 : SOFTWARE TESTING & QUALITY ASSURANCE
(Rev. 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) Write a detailed test plan for online milk ordering mobile Application. The application functionalities are registration, login, check quantity, price, discount, delivery time etc. **[6]**

b) Design suitable test cases for above Application. **[4]**

OR

c) Write a detailed test plane for university result declaration system, which provides the facility to view students result (sem/year) wise, system should have facility to apply for rechecking/re-evaluation with payment. **[6]**

d) Design suitable test cases for above application. **[4]**

Q2) a) What do you mean by software Quality Assurance? **[5]**

b) Explain different types of Reviews. **[5]**

OR

c) Explain building blocks of SQA and SQA activities. **[10]**

Q3) a) Explain the software Testing Life cycle (STLC). **[5]**

b) What is Test Driven Development (TDD)? How to perform TDD. **[5]**

OR

c) Define software Reliability? Explain various reliability measurement factors. **[10]**

P.T.O.

Q4) a) What are the levels of testing? Explain in detail. **[5]**

b) Explain verification and validation in software Testing. **[5]**

OR

c) Explain different types of Computer aided software testing tools. **[5]**

d) Differentiate: **[5]**

i) White Box and Black Box Testing.

ii) Static and Dynamic Testing.

Q5) Write short notes (Any two) **[10]**

a) Selenium

b) Incident Management

c) Localization and Internationalization

d) Product Risk and Project Risk

Total No. of Questions : 5]

SEAT No. :

PD1690

[Total No. of Pages : 3

[6432]-24
S.Y.M.C.A. (Management)
IT 34 : KRAI-ML-DL
(Revised 2020 Pattern) (Semester-III)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Use of calculator allowed.***
3) ***Figure on the side instructed full marks.***

Q1) a) What is intelligence and Artificial Intelligence? **[5]**

b) Explain SVM kernal in details. **[5]**

OR

c) Explain the techniquies of knowledge representation in details. **[5]**

d) Explain the process of clustering in details with suitable example. **[5]**

Q2) a) As per the law, it is a crime for an Indian to sell weapons to hostile nations. Country X, an enemy of India, has some missiles and all the missiles were sold to it by Ramesh, who is an Indian citizen.

Prove that Ramesh is a criminal. **[6]**

b) Construct the truth table of the following: **[4]**

i) $P \rightarrow (q \rightarrow P)$

ii) $(P \rightarrow q) \leftrightarrow (q \vee 7p)$

OR

c) Translate each of the following using FOL :- **[6]**

i) Not all cars have carburetors

ii) Some people are either religious or pious.

iii) No dogs are intelligent

iv) All babies are illogical.

v) All that glitters is not good.

vi) Some boys are sharp and intelligent.

d) Use a truth table to check the validity of the given premises and conclusion: **[4]**

If you are a hound dog, then you howl at the moon. You don't howl at the moon. Therefore, you are not a hound dog.

P.T.O.

Q3) a) Cluster the following eight points (with (x,y) representing locations) into three clusters:

A1 (2, 10), A2 (2, 5), A3 (8, 4), A4 (5, 8), A5 (7, 5), A6 (6, 4), A7 (1, 2), A8 (4, 9)

Initial cluster centres are A1 (2, 10), A4 (5, 8) and A7 (1, 2)

Use the k-means Algorithm to find the three cluster centres after the second iteration. **[6]**

b) Differentiate between supervised and unsupervised learning. **[4]**

OR

c) Using Naive Baye's Algorithm, find the prediction of following Data: **[6]**

OUTLOOK	TEMP	HUMIDITY	WIND	PLAYED
SUNNY	HOT	HIGH	WEAK	NO
SUNNY	HOT	HIGH	STRONG	NO
SUNNY	MILD	HIGH	WEAK	YES
SUNNY	COOL	NORMAL	WEAK	YES
SUNNY	MILD	NORMAL	STRONG	YES

Find:

i) P (SUNNY/YES)

ii) P (YES/SUNNY)

iii) P (TEM/HOT)

iv) P (WIND/STRONG)

d) Explain Reinforcement learning with suitable example. **[4]**

Q4) a) Find TFIDF of the following table: **[6]**

	W_0	W_1	W_2	W_3	W_4
r_0	1	1	0	0	0
r_1	1	0	0	-	-
r_2	0	1	1	-	1
r_3	1	0	1	0	0

Find:

i) TFIDF (r_0, w_3)

ii) TFIDF (r_1, w_4)

b) Explain Back propagation with suitable daigrams. **[4]**

OR

c) By using following single depth of input. **[10]**

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

Find:

i) Maxpool with 2 × 2 filter and stride 2.

ii) Average pool with 2 × 2 filter and stride 2.

Q5) a) Explain building blocks of Deep Learning in details. **[5]**

b) Explain Field programmable Gate Array in details. **[5]**

OR

c) Explain GAN with suitable examples. **[5]**

d) Explain speech recognition in AI. **[5]**

Total No. of Questions : 5]

SEAT No. :

PD1691

[Total No. of Pages : 2

[6432]-25

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

IT - 35 : CLOUD COMPUTING

(2020 Revised 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) What are the Advantage and Limitation of Cloud Computing? **[5]**

b) Explain Service Models in Cloud Computing in brief. **[5]**

OR

a) Differenciate between SAAS, PAAS and IAAS. **[5]**

b) Write short notes on Sales Force. **[5]**

Q2) a) What is Hypervisor? Explain types of Hypervisors. **[5]**

b) What is Virtual Machine? **[5]**

OR

a) Explain types of Virtualization. **[5]**

b) What is Para Virtualization? **[5]**

Q3) What are Web Services? Explain the different types of Web Services with suitable example. **[10]**

OR

P.T.O.

Write short note on : **[10]**

a) Cloud Availability.

b) Service level Agreement.

Q4) Differenciate between Parallel Programming and Parallel Processing. **[10]**

OR

Explain Cloud Computing Architecture & its characteristics with suitable diagram. **[10]**

Q5) What is Cloud Security and why is it required to maintain by Cloud Service Providers? **[10]**

OR

Write short notes on : **[10]**

a) Cloud Burshing.

b) QoS (Quality of Services).

Total No. of Questions : 5]

SEAT No. :

PD1692

[Total No. of Pages : 1

[6432]-31
S.Y.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) ***All questions carries equal marks.***

Q1) a) Differentiate between DevOps & Agile. **[5]**

b) What is version control system and explain its types with example (LVCS, DVCS, CVCS) **[5]**

OR

c) Explain RPM and YUM with suitable code. **[5]**

d) Explain the use of following GIT commands, Git add, git branch, git pull, git push, git clean. **[5]**

Q2) a) What is chef? Explain chef architecture with suitable diagram. **[10]**

OR

b) Explain the steps for installing the docker in Linux with suitable commands. **[10]**

Q3) a) Explain docker architecture in detail with suitable diagram. **[5]**

b) Explain the use of knife and nodes in chef. **[5]**

OR

c) How to create role in chef? Add some roles to the organization. **[5]**

d) Write all the steps installing docker on windows. **[5]**

Q4) a) Explain Maven Plugins with suitable diagram. **[5]**

b) Explain fetch, full and remote in details. **[5]**

OR

c) Explain Maven POM builds (pom. xml) **[5]**

d) Explain Exposing container ports, Container Routing in detail. **[5]**

P.T.O.

Q5) Write short notes (Any two) **[10]**

a) LEAN
b) Cloning in Git
c) Chef Console

OR

d) Docker Registry
e) Maven Local Repository
f) Merging the branches in Git

Total No. of Questions : 5]

SEAT No. : [ ]

PD1693

[Total No. of Pages : 3

[6432]-32

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

422 - BM 41 : PRINCIPLES AND PRACTICES OF MANAGEMENT & ORGANIZATIONAL BEHAVIOUR (PPM & OB)

(Revised 2020 Pattern) (Semester - IV)

Time : 2½ Hours] ***[Max. Marks : 50***

Instructions to the candidates:

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

Q1) a) As a student coordinator, you have been asked to coordinate fresher's party for first year student. Specify different functions you will consider to manage & execute this party? **[5]**

b) Explain Taylor's Scientific Management Theory. **[5]**

OR

c) Specify need and scope of Management? Elaborate different Managerial levels used in organizations? **[5]**

d) Explain Fayol's theory of Administrative Management. **[5]**

Q2) Describe different Leadership Styles used in management? **[10]**

OR

Write Maslow's need Hierarchy theory and Herzberg's Hygiene Theory of motivations. **[10]**

Q3) Shivani, a senior software engineer at MTS, was leading a critical project to develop a new mobile application. The project had tight deadlines and demanding client expectations, putting immense pressure on Shivani and her team. Despite her experience, Shivani found herself overwhelmed by the workload and struggled to manage her stress levels.

As the project progressed, Shivani began noticing a decline in Omkar's performance, a junior developer on her team. Omkar, eager to prove himself, often worked late hours and took on additional tasks to meet deadlines. However, the mounting pressure took a toll on his productivity, and he started making mistakes, causing delays in project delivery.

P.T.O.

Shivani's attempts to address Omkar's performance issues were met with resistance, as he felt misunderstood and underappreciated.. Their disagreements escalated during a team meeting when Shivani expressed frustration over missed deadlines, leading to a heated argument between them.

Lisa, the HR manager at MTS, became aware of the conflict between Shivani and Omkar through employee feedback channels. Concerned about the impact of work stress on team dynamics and productivity, Lisa decided to intervene and address the issue proactively. **[10]**

- How can Sham, the project manager, effectively mediate the conflict between Shivani and Omkar to restore collaboration within the team and ensure the successful completion of the project?
- What strategies can Lisa implement to promote a healthy work environment and alleviate work stress among employees at MTS?

OR

Sanket, a dedicated team leader at GSI, was leading a cross-functional team to develop a new software application. The project was critical for the company's expansion plans, and the team faced tight deadlines and high expectations from stakeholders. As the project progressed, Sanket noticed signs of stress among team members, including Ram, a senior software engineer known for his expertise in coding.

Ram, although highly skilled, started exhibiting signs of burnout due to the demanding workload and pressure to deliver results. His productivity declined, and he became irritable and withdrawn, causing friction within the team. Sanket recognized the need for intervention and decided to address the issue proactively. Meanwhile, Maya, the HR manager at GSI, conducted regular stress management workshops and wellness programs to support employee well-being. However, despite these efforts, conflicts continued to arise within teams, affecting productivity and morale. As the situation escalated, Sanket sought assistance from Pooja, a conflict resolution specialist hired by GSI to facilitate communication and resolve conflicts within teams. Pooja conducted mediation sessions with Sanket and Ram, allowing them to express their concerns openly and explore solutions collaboratively.

Through mcdiation, Sanket and Ram identified underlying stressors and communication barriers contributing to their conflict. They agreed to implement strategies for effective stress management, such as setting realistic deadlines, promoting work-life balance, and improving communication channels within the team. **[10]**

- How can Maya, the HR manager, enhance the effectiveness of stress management initiatives at GSI to address the underlying causes of stress and promote employee well-being across departments?
- What role can Pooja, the conflict resolution specialist, play in fostering a culture of open communication and collaboration at GSI to prevent conflicts and promote a harmonious work environment?

Q4) How you can elaborate concept of Team? Which are the key benefits of working in a team? Also discuss different types of Teams? **[10]**

OR

Write note on **[10]**

a) Ego State

b) Johari window

Q5) a) As a project manager, you might be required to take different decisions. Please specify different decision taking environment in detail. **[5]**

b) Categorize common types of corporate cultures used in different organizations. **[5]**

OR

c) Suppose, in your organization you have been selected as team member for strategic decision purpose, please specify decision making processes with suitable example. **[5]**

d) Classify different organization structures used in different business organizations. With suitable example. **[5]**

Total No. of Questions : 7]

SEAT No. : ____

PD-1694

[Total No. of Pages : 2

[6432] - 101
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 indicate full marks.***

Q1) a) Write an algorithm for sum of first *n* even numbers. **[5]**

b) Explain Greedy algorithmic Paradigms **[5]**

Q2) a) Difference between macro and inline function. **[5]**

b) Explain Call by value and Call by reference in C++. **[5]**

OR

a) Write a function to check given number is prime or not. **[5]**

b) Explain friend function with example. **[5]**

Q3) a) Write a program to overload the operator = = to check two rational numbers are equal or not. Rational is user defined class having numerator and denominator as data members. **[7]**

b) Write a program to overload unary ++ operator using friend function.**[3]**

OR

a) Write a rules for overloading any operator. **[7]**

b) Write a program to overload + to concatenate two strings. **[3]**

P.T.O.

Q4) a) Define class employee with required data members and derive manager class from employee. **[7]**

b) What is class? **[3]**

OR

a) What is run time polymorphism with example. **[7]**

b) What is function of linker and loader in Compilation process. **[3]**

Q5) a) Explain manipulators in C++ with example. **[7]**

b) What is reference variable. **[3]**

OR

a) Write a program to use memory management operators. **[7]**

b) Explain goto statement in C++. **[3]**

Q6) a) Create a class point (X,Y) and overload ++ and – to increase and decrease point value. **[7]**

b) Explain const keyword in C++ **[3]**

OR

a) Define class student (roll no, name, percentage) and provide member function to seter and geter for student details. **[7]**

b) What is scope resolution operator. **[3]**

Q7) a) Write algorithm for Tic tac Toe **[7]**

b) Explain structure in C++ **[3]**

OR

a) Write an application for Tower of Hanoi. **[7]**

b) What keyword? Explain with the help of program. **[3]**

Total No. of Questions : 7]

SEAT No. :

PD-1695

[Total No. of Pages : 2

[6432]-102
F.Y. 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 from remaining.***
3) ***Draw neat & labelled diagram wherever necessary.***

1) QuickRide is a leading mobile application designed to deliver a superior and hassle-free taxi booking experience to passengers. The app excels in providing a range of functionalities that transform the process of booking and taking taxi rides into a seamless and efficient journey. It also places a strong emphasis to ensure the app's performance, security and high standard user experience.

   Prepare the SRS for the above system in IEEE format. **[20]**

2) Construct a sequence diagram for enrolling to an online course. Depict actions like course selection, registration for the course, and payment. **[10]**

3) Design GUI screen for reserving a book in an online library app, MyLibrary **[10]**

4) Describe Spiral model with a neat diagram **[10]**

5) Draw an activity diagram to outlines the process of an instructor creating a new course module/modify an existing course module for a Massive Open Online Course (MOOCs) application **[10]**

P.T.O.

6) Prepare a class diagram for an online library app, MyLibrary which handles member enrolment, book issue and return process and fine calculation on late book return. **[10]**

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

a) Web Engineering

b) Scrum

c) Role of a System Analyst

Total No. of Questions : 7]

SEAT No. :

PD1696

[Total No. of Pages : 2

[6432]-103
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) ***Q.1 is compulsory.***
2) ***Solve any 5 questions from remaining.***

Q1) The registrar at a small college wants an application that will help their department keep track of the schedule of classes, the courses and lecturers appearing in the schedule, and the students registering for courses according to the schedule.

Courses are scheduled every semester, and this is documented in the schedule of classes, which also documents the lecturers assigned to each schedule of a class. Students register for courses according to the schedule of classes.

Users (students, lecturers, and other college staff) must login to the application to gain access, and the application must keep track of user logins/logouts. In addition, users must have different levels of access, which will determine their access to different parts of the application. Construct the ERD and normalize the database upto 3 NF. **[20]**

Q2) What is DBMS? explain Need for DBMS. **[10]**

Q3) Explain the OODBMS with example. **[10]**

Q4) Consider the following schedule of transactions T1, T2, and T3: **[10]**

T1: R(A), W(A)

T2: W (A), R (B)

T3: W (B), R (A)

Determine whether the given schedule is serializable or not, and if not, identify the conflicting operations.

P.T.O.

Q5) a) How Serilizability can be achieved?

b) Explain Recovery with concurrent transactions.

[10]

Q6) Explain recovery from catastrophic failure. **[10]**

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

a) Cloud databases

b) XML Applications

c) Types of NoSQL database

ⓘⓘⓘⓘ

Total No. of Questions : 7]

SEAT No. : ____

PD3910

[Total No. of Pages : 2

[6432]-104R

First Year M.C.A. (Management)

IT-14 : ESSENTIAL 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 and labelled diagrams wherever necessary.***

Q1) a) What is a Process? Explain Process Control Block (PCB) with diagram **[10]**

b) Draw Gantt Chart and Calculate Average Waiting Time for following FCFS Scheduling. **[10]**

Process	Burst Time	Order	Arrival Time
P1	2	1	0
P2	3	2	0
P3	4	3	0

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

OR

What is mobile OS? Explain any 1 architecture of mobile OS in detail.

Q3) Consider the reference string 6, 1, 1, 2, 0, 3, 4, 6, 0, 2, 1, 2, 1, 2, 0, 3, 2, 1, 2, 0 For a memory with three frames and calculate number of page faults by using FIFO Page replacement algorithm. **[10]**

Q4) What is Linux? Explain process and file structure in linux. **[10]**

OR

Define Linux shell. Explain various shell in Linux OS.

P.T.O.

Q5) What is kernel? Explain kernel and shell management in linux. **[10]**

OR

Explain user management in Linux.

Q6) Explain logical and Physical memory allocation with example. **[10]**

OR

Explain Paging Vs. Segmentation.

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

a) Demand Paging

b) Mutual Exclusion

c) Thrashing

Total No. of Questions : 5]

SEAT No. :

PD1698

[Total No. of Pages : 2

[6432]-105

First Year M.C.A. (Faculty of Management)
BM-11: BUSINESS PROCESS DOMAIN
(2019 Pattern) (Semester - I)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question no.1 & 8 is compulsory.***
2) ***Attempt any four from remaining.***
3) ***Use of simple calculator is allowed.***
4) ***Figurtes to the right indicate full marks.***

Q1) Shivani Milk and Milk products Pvt. Ltd is one of the growing milk based manufacturing organizations situated at Pune. They want to transport milk and milk based product throughout the India to their wholesalers. As a manager you have been asked to-

a) Suggest different modes of transportation to be considered. **[10]**

b) Suggest CRM system suitable for transport management system. **[10]**

Q2) a) Mr. Sharma's Basic salary=Rs. 40,000. DA=115%, He has completed 26 years of no. of service. Calculate eligible gratuity amount for him. **[5]**

b) Mr. A is getting basic pay= Rs. 50,000, DA=110%, 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) Elaborate different business models of ecommerce to be consider for business? **[10]**

OR

Elaborate different electronic payment systems used in modern businesses.**[10]**

Q4) What are different types of Leaves the business organization can sanction?**[10]**

OR

Which are different types of inventory control technique? Explain any one in brief. **[10]**

P.T.O

Q5) To start any business you should know different types of accounts. Please summarize different types of account. **[10]**

Q6) Shivraj baba Chain of Hotels in one of the renowned Hotel Services Company, wants to bind his customers for long term business gain. You have been asked to suggest CRM life cycle with reference to Shivraj baba Chain of Hotels.**[10]**

Q7) Nitesh want to apply for Loan to start his business. As an advisor suggest various types of loans. Also discuss Loan Sanction Process. **[10]**

OR

Discuss different types of insurance. Also discuss insurance processes in short. **[10]**

Q8) Write short notes on any two. **[2×5=10]**

a) Insourcing and outsourcing.

b) Operational and legal risks of e-payments.

c) Supply chain management.

✠ ✠ ✠

Total No. of Questions : 7]

SEAT No. :

PD-1699

[Total No. of Pages : 2

[6432] - 201
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.***

1) Explain array as a Data structure. Write an algorithm to perform array insert & delete operations. Accept array insert & delete elements as input from user. **[10]**

2) a) Convert following infix expression to postfix form. Represent content of stack at each step in tabular form **[10]**

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

OR

b) Write an algorithm to check for valid expression (Parenthesis checking). **[10]**

3) a) What is Priority Queue? White an algorithm that perform stack operations. **[10]**

OR

b) Write an algorithm to perform circular queue operations. **[10]**

4) a) Write an algorithm for insertion of a node in doubly linked list. **[10]**

OR

b) Define linked list. Write an algorithm to delete an element from linked list. **[10]**

5) a) Draw a Binary search tree for following **[10]**

Also write it's all tree traversals

23, 89, 34, 67, 99, 2, 55, 45, 78, 12, 56.

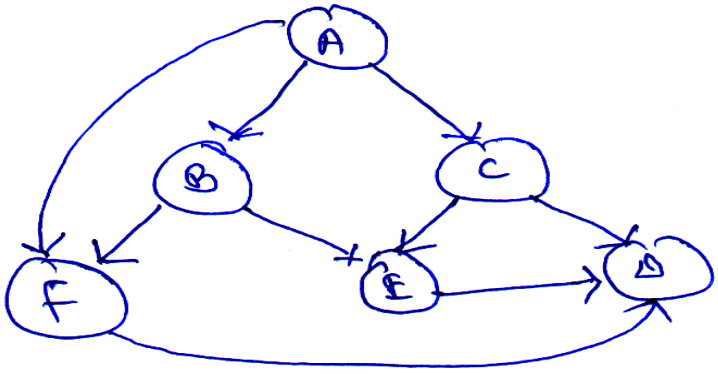
OR

b) Construct AVL tree for the following **[10]**

8, 15, 1, 19, 16, 4, 25, 12, 23, 20, 17.

P.T.O.

6) a) Answer using following graph **[10]**



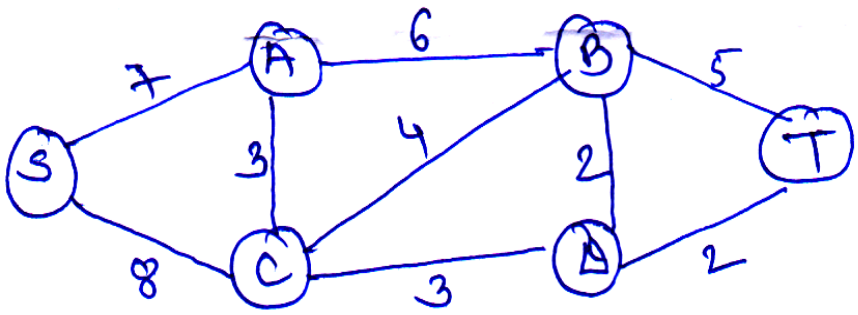
i) Write adjacency matrix

ii) Write adjacency list

iii) Generate BFS & DFS output with starting vertex in A.

OR

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



7) Write short note on (any two) : **[10]**

a) Threaded Binary Tree

b) Quick sort

c) Dijkstra's Algorithm

Total No. of Questions : 7]

SEAT No. :

PD1700

[Total No. of Pages : 2

[6432]-202

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

IT - 22 : WEB TECHNOLOGY

(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 suitable form for CET Registration and validate any five different fields with different criteria using Java Script. **[10]**

Q2) Write a program to implement Audio and Video features for your web page. **[10]**

OR

Write a program to implement Canvas and SVG in HTML Page.

Q3) Write a program to convert Celcius to Farenhite using Java Script. **[10]**

OR

Explain different control statement with suitable example in Java Script.

Q4) Explain different types of CSS with suitable examples of each type. **[10]**

OR

Write a code to implement CSS in HTML Page.

a) Text with overline

b) Paragraph with Image

c) Text with size 48 and color Red

d) Transition of Div Pannel

e) Page with scroll background

P.T.O.

Q5) Explain the JQuery Events with Attributes using examples. **[10]**

OR

Explain the different methods related to manipulating the elements in HTML Page using JQuery.

Q6) Write a program to insert the students details while taking Admission to college using PHP. **[10]**

OR

Write a program to implement sessions in web page and destroy the session after 20 days.

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

a) HTML 5 Elements.

b) Scaling using CSS.

c) Operators in JS.

d) Filters in JQuery.

e) Error handling in PHP.

Total No. of Questions : 7] **SEAT No. :**

PD1701 **[Total No. of Pages : 2**

[6432]-203
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 and Q.7 are compulsory.***
2) ***Solve any four questions from Q.2 to Q.6.***
3) ***Figures to right indicate full marks.***
4) ***Draw neat diagrams wherever necessary.***

Q1) a) What is cryptography? Explain symmetric and asymmetric methods with an example. **[10]**

b) For the given class C, 197.159.223.13 and subnet mask 255.255.255.240

Calculate

i) Total Number of Subnets

ii) Total Number of Host IP per subnet

iii) First and Last subnet address

OR

Find the subnet ID for the IP address 201.191.129.67 with a subnet mask of 255.255.255.224. **[5]**

Q2) What is the concept provided by ISO to form layering? **[10]**

Q3) What is DNS? What information is passed in DNS message and How? **[10]**

Q4) What is HTTP? Explain with example Status code and Error status code in detail. **[10]**

P.T.O.

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

Q6) Generate CRC code for the data word 1110001100 using the divisor 11010.**[10]**

OR

Generate a Hamming code with binary value 11001101011 using an even parity. **[10]**

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

a) X.25

b) Transmission Media

c) Flow and error control

d) Specific Addresses

e) Firewall

❋ ❋ ❋

Total No. of Questions : 5]

SEAT No. :

PD1702

[Total No. of Pages : 4

[6432]-204

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 allowed and statistical table is allowed.***
3) ***Figures to the right indicate full marks.***
4) ***Solve (a, b) or (c, d) of each question.***

Q1) a) Discuss the importance of study of statistics. Enumerate the various sources of collecting secondary data. **[7]**

b) Explain the various uses of t-test in testing of hypothesis. **[7]**

OR

c) Discuss sampling & advantages of sampling. **[7]**

d) Draw the pie diagram for following data Revenue collections for the year 2008-09 by government in Rs. (lakh) for petroleum products are as follows: **[7]**

Customs	9,600
Excise	49,300
Corporate Tax	18,900
GST	48,800

Q2) a) Calculate the Median from the following data : **[7]**

Score	0-10	10-30	30-60	60-80	80-90
No. of Players	7	10	15	9	3

b) Calculate coefficient of variation from the following data : **[7]**

Age	10-20	20-30	30-40	40-50	50-60
No. of Students	15	12	18	30	32

OR

P.T.O.

c) Calculate standard deviation from the following data : **[7]**

Size of item	8	9	10	11	12	13	14
Frequency	3	6	8	7	9	5	8

d) A man travels from Pune to Mumbai by a car and takes 14 hours to cover the whole distance. In the first hour he travels at a speed of 60 km/hr, in the second hour his speed is 65 km/hr, in third hour his speed is 80 km/hr and in the fourth hour he travels at the speed of 75 km/hr. Find the average speed of the car. **[7]**

Q3) a) Find the t-test value for following two sets of values : 3, 5, 7, 2 and 6, 3, 1, 4? **[7]**

b) A survey amongst women was conducted and study the family life. The observation are as follows. Test whether there is any association between family life and education of women. **[7]**

Women	Family Life		Total
	Happy	Not Happy	
Educated	80	20	100
Not Educated	40	60	100
Total	120	80	200

OR

c) 7 students are selected at random from a large numbers of students in class. The number of MCQ produced by them on a certain day are found to be : **[7]**

27, 29, 35, 28, 34, 39, 36, 31, 26

In the light of these data, would it be appropriate to suggest that the mean if the number of MCQ's produced in the population is 37?

d) Can a dice be considered regular which is showing the following frequency distribution during 1,000 throws? **[7]**

Thrown value	1	2	3	4	5	6
Frequency	182	154	162	175	151	176

Q4) a) Construct index numbers of the following data by Fisher's 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) The following table gives the distribution of marks of Marathi and marks of Hindi of five students. Check if there is a relation between marks of Marathi and marks of Hindi. **[7]**

Marks in Marathi	18	29	30	36	40	45
Marks in Hindi	23	64	66	80	80	30

OR

c) Calculate Laspeyres & Paasche's price index number on the basis of the following data : **[7]**

Commodity	A	B	C	D	E
Base year Price (P_0)	10	25	30	15	20
Current year Price (P_1)	15	40	45	30	25
Base year Quantity (q_0)	6	10	15	20	8
Current year Quantity (q_1)	8	20	12	15	6

d) 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

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

b) Fit a straight line trend on the following data using the least squares method. **[7]**

Period (year)	1996	1997	1998	1999	2000	2001	2002	2003	2004
Y	4	7	7	8	9	11	13	14	17

OR

c) Calculate the 5 yearly moving average of the number of students in a college from the following data : **[7]**

Year	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
No. of students	332	317	357	392	402	405	510	427	405	438

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

i) Level of Significance

ii) Degree of Freedom

iii) Statistic and Parameter

Total No. of Questions : 5]

SEAT No. :

PD1703

[Total No. of Pages : 2

[6432]-205

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

Q1) a) What are the various managerial functions? Describe it in detail. **[5]**

b) Define Henry Fayal's principles of management with its applications. **[5]**

OR

a) Being a Project Manager of an IT company describe need, process of management, also discuss different managerial skills required with suitable example. **[5]**

b) What is scientific management? Describe Taylor's 4 principles of scientific management. **[5]**

Q2) a) What are the various types of decisions? Explain the process of decision making with example. **[10]**

b) Mr.Sham is a CEO of a big production organization. Being head of organization analyse decision making under certainty, under uncertainty and under risk and explain it in detail. **[10]**

OR

a) Compare individual and group decision making in detail. **[10]**

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. **[10]**

Q3) a) Describe Herbert Simon's model & principle of rationality with example. **[10]**

b) Being a Team Leader how to enhance the relationship between organization and individual analyse it with different leadership style. **[10]**

OR

P.T.O.

a) Explain organizational structure in detail. **[10]**

b) 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) a) What are the Qualities for Leadership? Differentiate Leader Vs Manager.**[5]**

b) What is Theory X and Y, Theory Z? How it is useful discuss it in detail with example. **[5]**

OR

a) Explain Maslow's need Hierarchy theory with diagram. **[5]**

b) What is the team building discuss the various types of teams. **[5]**

Q5) a) Explain stages of conflict process and how it work in organization. **[5]**

b) Describe various sources & types of stress along with the techniques to resolve the stress. **[5]**

OR

a) Describe Johari window in detail with example. **[5]**

b) What are the different determinants of personality? How there are helpful in real life and professional life? **[5]**

Total No. of Questions : 7]

SEAT No. : ____

PD1704

[Total No. of Pages : 2

[6432]-301
Second Year M.C.A. (Management)
IT31 : JAVA PROGRAMMING
(2019 Pattern) (Semester - 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) Use of 'this'

b) What is checked exceptions in Java?

c) Use of 'package' keyword in Java.

d) What is OOP's feature Encapsulation?

e) Any two string methods.

f) Explain use of 'interface' keyword.

Q2) a) Write JDBC application to accept workshop registration details from the user. **[10]**

(Assume suitable table structure)

OR

b) Explain JDBC drivers with neat diagram. **[10]**

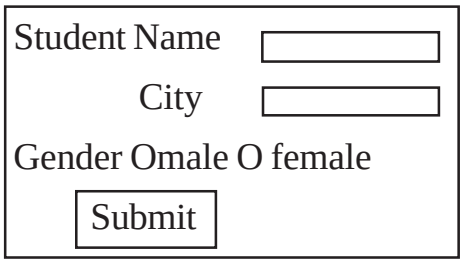
Q3) a) Explain implementation of thread in Java. Elaborate it by using any one with suitable example. **[10]**

OR

b) Explain Array list collection? In Java with its example. **[10]**

P.T.O.

Q4) a) Design following GUI using AWT components. **[10]**



OR

b) What in Action listener? Elaborate it with example? **[10]**

Q5) a) What are servlet type? Write a program to find factorial of user inputed number. **[10]**

OR

b) Explain JSP action tags in detail. **[10]**

Q6) a) Write client-server chating application. **[10]**

OR

b) Write a remote method Armstrong (int) that will take one number from client & check whether a given number is Armstrong number or not.**[10]**

Q7) White short note (Any two) **[10]**

a) Overriding.

b) Java Beans.

c) MVC architecture

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Total No. of Questions : 8]

SEAT No. :

PD-2896

[Total No. of Pages : 2

[6432]-302

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

IT-32: DATA WAREHOUSING & DATA MINING

(2019 Pattern) (Semester - III)

Time : 3Hours] *[Max. Marks : 70*

Instructions to the candidates :

1) ***Q1 & Q8 are compulsory.***
2) ***Solve any Five questions from Q2 to Q7.***
3) ***Figures to the right indicate full marks.***

Q1) What is data cleaning? Explain various process involved in data cleaning. **[10]**

Q2) Explain Data warehouse architecture in detail. **[10]**

Q3) Consider the following given Transaction set. Generate Frequent Item sets using FP Growth Algorithm (Minimum Support =3)

Transaction Id	Items
1	f,a,c,d,g,m,p
2	a,b,c,f,t,m,o
3	b,f,h,o
4	b,k,c,p
5	a,f,c,t,p,m,n

[10]

Q4) What is classification and explain Support Vector Machines (SVM) with example. **[10]**

Q5) Discuss the K- nearest neighbour classification algorithm with suitable example. **[10]**

Q6) Explain Text-mining and applications of text mining. **[10]**

P.T.O.

Q7) What is OLAP? Write Difference between OLAP and OLTP: **[10]**

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

a) Web Mining

b) Knowledge Discovery process

c) Dimensional Modelling

d) Back propagation

Total No. of Questions : 8]

SEAT No. : ____

PD1705

[Total No. of Pages : 1

[6432]-303

Second Year M.C.A. (Management Faculty)

IT-33 : TESTING AND QUALITY ASSURANCE

(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 and labelled diagrams wherever necessary.***

Q1) Write a test plan with scope and objectives of testing, risks, contingencies and strategy, schedule, deliverables for HairStylist and online Saloon management application. **[10]**

Q2) Define Software Quality Assurance & explain the software Quality Assurance activities. **[10]**

Q3) Explain the role of testing in SDLC and Explain the fundamental test process. **[10]**

Q4) Elaborate on the types of review techniques involved in static testing. **[10]**

Q5) Define Integration Testing and describe the approaches for integration testing. **[10]**

Q6) Write four test cases for adding items into a cart in an e-commerce app, covering both positive and negative scenarios. **[10]**

Q7) What is CAST? Explain any four types of Testing Tools. **[10]**

Q8) Write short notes. (any Two) **[10]**

a) Smoke and Sanity Testing

b) Usability Testing

c) Alpha and Beta Testing

Total No. of Questions : 8]

SEAT No. :

PD1706

[Total No. of Pages : 1

[6432]-304
S.Y.M.C.A. (Management)
IT 34 : CLOUD COMPUTING
(2019 Pattern) (Semester-III)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

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

Q1) Define cloud computing. Explain cloud service models and types with examples. **[10]**

Q2) What is virtualization? Why it is required? Explain benefits of virtualization. **[10]**

Q3) Explain security issues and challenges in cloud computing. **[10]**

Q4) Explain SaaS and web services with examples. **[10]**

Q5) Explain difference between Cloud computing Vs Cluster computing Vs Grid computing. **[10]**

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

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

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

a) NIST model

b) Web services

c) AWS

Total No. of Questions : 8]

SEAT No. :

PD1707

[Total No. of Pages : 4

[6432]-305
S.Y. M.C.A. (Management Faculty)
MT - 31 : PROBABILITY AND COMBINATORICS
(2019 Pattern) (Semester-III)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

1) ***Question No. 1 & Question No. 8 are compulsory.***
2) ***Attempt any four questions from remaining.***
3) ***Figures to the right indicate full marks.***
4) ***Use of non-programmable calculator and statistical table is allowed.***

Q1) Solve any 3 subquestions out of 5 : **[3×5=15]**

a) Let x be a random variable such that $P(x=3)=P(x=4)$, $P(x=6)=P(x=7)$ and $P(x>5)=P(x<5)=P(x=5)$. Obtain the probability mass function for x and its distribution function. **[5]**

b) Let x be a random variable with the following distribution : **[5]**

x	:	–3	6	9
P(X = x)	:	$1/6$	$1/2$	$1/3$

Find E(X) and E(X^2) also evaluate E($2x + 1$).

c) In how many ways can you put 8 letters into their respective envelops such that exactly 4 go into the right envelops? **[5]**

d) Among 60 students in a class. 45 passed in the first semester examination & 30 passed in second semester examination. If 12 did not pass in either semester. How many pass in both semester. **[5]**

e) If a pair of dice is thrown, find the probability that the sum of digit on them is neither 7 or 11. **[5]**

P.T.O.

Q2) a) The number of solutions of the questions $x + y + z = 18$ exist subject to the constraint $x \geq 1,\ y \geq 2,\ z \geq 3$. **[5]**

b) A bag contain 45 ball numbered from 1 to 45, one ball is drawn at random. Find the probability that the number on ball drawn will be : **[5]**

i) Even number

ii) Prime number

iii) Odd number and multiple of 5

Q3) a) If x is uniform continuous distribution with mean 1 and variance $\frac{1}{3}$; find $P(x < 0)$. **[5]**

b) Explain the following terms with examples : **[5]**

i) Event

ii) Random variable

Q4) a) The joint probability density function of a random variable (X, Y) is,

$$f(x,y) \leq C(x+y) \quad 0 < x < 2,\ 2 < y < 4$$
$$= 0 \qquad\qquad \text{otherwise}$$

[5]

Find

i) C

ii) E(X)

b) Obtain Poisson distribution is a limiting condition of binomial distribution. **[5]**

Q5) a) If x is uniformed discrete distributed over (0, 10). Calculated the probability that : **[5]**

i) $x < 3$

ii) $x > 6$

iii) $3 < x < 8$

b) In a sequence of Bernoulli's trials. Let X be the length of the run of either successes or failures starting with the first trial. Find E(X) & V(x). **[5]**

Q6) a) Determine the coefficient of $x^4y^9z^6$ in the expansion $\left(x^2-3y^3-4z^2\right)^8$. **[5]**

b) It is known that screws produced by a certain machine will be defective with probability 0.02. Independent of each other. The screws sold in packages of 200. Find the package there will be : **[5]**

i) no defective

ii) Atleast 3 defectives

Q7) a) A continuous RVX has a pdf $f(x)=k(x+2)\ 0<x\le 3$. Find k_1 mean and variance. **[5]**

b) Two cards are drawn from a well shuffled pack of cards. What is the probability that : **[5]**

i) both cards are face cards

ii) one card is face cards

Q8) Solve any 3 subquestions out of 5 : **[3×5=15]**

a) $P(X = x) = \frac{x^2}{30},\ x = 0,1,2,3,4$: **[5]**

Find

i) $P(0 < x \leq 2)$

ii) Cumulative distribution function of X

b) How many ways eight boys can sit **[5]**

i) in a row

ii) around circles

If 2 particular boys will always sit side by side in both the cases.

c) Determine the binomial distribution for which the mean is 4 and variance 3. Find mode. **[5]**

d) The following table represent the joint probability distribution of discrete variable X & Y. **[5]**

X \ Y	1	2	3
1	k	2k	3k
2	4k	5k	6k
3	8k	9k	11k

Find :

i) k

ii) Conditional probability distribution X given Y = 1

iii) Conditional probability distribution Y given X = 2

e) Prove by combinational arguments : **[5]**

i) $\sum_{k=0}^{r} \binom{m}{k}\binom{n}{r-k} = \binom{m+n}{r}$

ii) $\binom{2n}{n} = 2\binom{n}{2} + n^2$

Total No. of Questions : 7]

SEAT No. :

PD1708

[Total No. of Pages : 1

[6432]-401
Second Year M.C.A. (Management)
IT41 : PYTHON PROGRAMMING
(2019 Pattern) (Semester - IV)

Time : 3 Hours] ***[Max. Marks : 70***

Instructions to the candidates:

1) ***Question No.1 and 7 are compulsory.***
2) ***Solve any 4 from remaining.***
3) ***Figures to the right indicate full marks.***

Q1) a) Write a program to print prime numbers between 1 to 50. **[5]**

b) Explain lambda function with proper example. **[5]**

Q2) a) What is inheritance? Explain multiple and multilevel in heritance with example. **[5]**

b) Write a program to validate password using Regular expression. **[5]**

Q3) a) Explain different types of inbuilt exception in python. **[5]**

b) What is multithreading in python? Explain with proper example. **[5]**

Q4) What is pandas? Explain series in pandas in detail. **[10]**

Q5) a) What is name space package in python? Explain with proper example. **[5]**

b) Explain operator overloading in python with example. **[5]**

Q6) a) Write a program to plot a line chart. **[5]**

b) Write a program to print greatest number between three numbers using python. **[5]**

Q7) Write a short notes on. (Any Four) **[20]**

a) read (), readline ( )

b) constructor.

c) Creating and searching tables.

d) Numpy.

e) Thread synchronization.

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Total No. of Questions : 7]

SEAT No. :

PD1709

[Total No. of Pages : 2

[6432]-402

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

IT 42: 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 labeled diagram wherever necessary.***

Q1) a) What is Enterprise Architecture? What are the objectives of Enterprise Architecture? **[7]**

b) Explain BAIN (Banking Industry Architecture) framework. **[8]**

Q2) What is Architecture? Explain the need and charecteristics of an Architecture. **[10]**

Q3) Describe Application Architecture. What are the types of application architecture and perations in application architecture. **[10]**

Q4) List out the applicability of frameworks in different stages of SDLC phases. **[10]**

Q5) a) Why is ISO important and what are the functions of ISO? **[5]**

b) What are the areas of Project Management Body of Knowledge (PMBOK). **[5]**

Q6) a) Explain Business Process Framework (eTOM). **[5]**

b) What is the role of COBIT Framework. **[5]**

P.T.O.

Q7) Write short notes on (any three). **[3×5=15]**

a) Architecture patterns & styles

b) ZACHMAN framework

c) Frameworks for developing web application

d) Six sigma and Lean

e) Architecture framework roadmap.

Total No. of Questions : 5]

SEAT No. :

PD1710

[Total No. of Pages : 1

[6432]-403
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) Differentiate between forward chaining and backward chaining. **[10]**

b) What are informed search methods? Explain greedy best first search algorithm. **[10]**

Q2) a) Define Production systems and its characteristics. **[10]**

OR

b) What are the properties of good knowledge-based system? **[10]**

Q3) a) Explain the architecture of simple reflex agent. **[10]**

OR

b) Explain minimax algorithm with appropriate example. **[10]**

Q4) a) What is expert system? Explain characteristics of expert system. **[10]**

OR

b) How does natural language processing work? **[10]**

Q5) Write a short note on (Any Four) : **[20]**

a) Supervised Learning.
b) Hierarchical Planning.
c) Types of planning system.
d) Conditional Planning.
e) State space search.

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Total No. of Questions : 8]

SEAT No. :

PD1711

[Total No. of Pages : 3

[6432]-404

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 questions from Question no 2 to question No. 8.***
3) ***Figures to the right indicate full marks.***
4) ***Use of Non-programmable calculator & statistical table is allowed.***

Q1) a) The following table shows the jobs of a network along with their time estimates **[10]**

Jobs	Optimistic time (days)	Most likely time (days)	Pessimistic time (days)
1-2	1	7	13
1-6	2	5	14
2-3	2	14	26
2-4	2	5	8
3-5	7	10	19
4-5	5	5	17
6-7	5	8	29
5-8	3	3	9
7-8	8	17	32

i) Draw the network diagram

ii) Find the critical path

iii) Project completion time and project variance

iv) Probability that project will be completed in 40 days

P.T.O.

b) Solve the following transportation problem to find optimum solution and cost associated with it **[10]**

Sources	Destination				Supply
	1	2	3	4	
1	11	13	17	14	250
2	16	18	14	10	300
3	21	24	13	10	400
Demand	200	225	275	250	

Q2) Solve the following game. Find the optimal strategy of A and B, value of the 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	2	4	3	3	8
	A_4	5	6	2	2	1

Q3) Annual demand of an item is 2,400 units ordering cost is Rs 350 per order. Inventory carrying cost is 24% of the purchase price per year. Price per item is 9.25 Rs. Find **[10]**

a) Economic order quantity

b) Total cost related to economic order quantity

c) Optimum number of orders

d) Time between two orders

Q4) A company has 4 machines and 4 tasks The time required for each task on each machine is given below (Time in hours). Find the assignment which minimize the total set up time for all tasks **[10]**

	Task 1	Task 2	Task 3	Task 4
Machine 1	13	8	7	6
Machine 2	7	11	5	4
Machine 3	6	7	6	8
Machine 4	5	6	5	9

Q5) Customer arrive at a one window drive through pharmacy according to poisson distribution with a mean of 10 per hour. The service time per customer is exponential with a mean of 5 minutes **[10]**

a) What is the probability that customer has to wait

b) Number of customers in the system

c) Average waiting time of customer before getting the service

Q6) Solve the following using simplex method. **[10]**

$$\text{Max } Z = 3x_1 + 2x_2 + 5x_3$$

subject to $x_1 + x_2 + x_3 \leq 9$

$$2x_1 + 3x_2 + 5x_3 \leq 20$$

$$2x_1 - x_2 - x_3 \leq 8$$

$$x_1, x_2, x_3 \geq 0$$

Q7) A Machine owner finds from his past records that the maintainance costs per year of a machine whose purchase price is Rs. 8,000 are as given below.

Year	1	2	3	4	5	6	7	8
Maintainance cost	1,000	1,200	1,700	2,200	2,900	3,800	4,800	6,000
Resale value	4,000	2,000	1,200	600	500	400	400	400

Determine at which time it is profitable to replace the machine **[10]**

Q8) Six jobs go first on macine A, then machine B & then machine C. The time of their processing on 3 machine in hours is given below **[10]**

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

Find the sequence of jobs that minimizes total elapsed time to complete all jobs Also find idle time of all 3 machines

Total No. of Questions : 6]

SEAT No. :

PD1712

[Total No. of Pages : 2

[6432]-405

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

BM - 41 : INFORMATION SYSTEM & 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 diagram wherever necessary.***

Q1) Jeevan charging Ltd., is a firm providing their customers an internet banking facilities. It's main customers are some of the biggest bank of India. Its employees, who have access to all the financial accounts, personal data and credit card information of approximate 15 million clients of these banks. You have been deputed as Information security manager and have been allocated the duty to assessing the possible security breaches which might occur. **[10]**

a) What are the different types of Vulnerabilities you might identify?

b) List the threats you might identify from above case.

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

b) Explain the Pillar's of information security. **[5]**

Q3) National textile mill decided to computerize their operations by using internet and SMS plugging services for communicating with cotton harvesting farmers. You have been deputed by your software firm as information security policy maker for this textile mill. **[10]**

a) What security standards you will going to prose for this case?

b) Which security policies you will design for this case.

P.T.O.

Q4) What is Information Security Controls? Explain Business Continuity Plan. **[10]**

Q5) a) Perform the auditing of an educational institution having computerization for admission process, examination including result declaration. Prepare a detail audit report covering the auditing objectives, need of audit and key success factors for security audit of this case. **[10]**

b) Explain IT governance framework - COBIT. **[10]**

OR

a) Web4U company is implementing SAP-ERP system for their day to day operation of developing and checking continuity of IT service to end users. You have been requested to conduct technology based audit and asked to do following types of testing. **[10]**

i) Write vulnerability scanning process.

ii) List out steps for penetration testing.

b) Explain dimensions and objectives of IT Governance. **[10]**

Q6) Write short note on (Any two) : **[2×5=10]**

a) Is Audit Process.

b) Vulnerability Scanning.

c) ITIL.

d) Types of Audit and Approaches.

Total No. of Questions : 8]

SEAT No. :

PD1713

[Total No. of Pages : 1

[6432]-501

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

Q1) A newly established start-up company prepares parts for digital gadgets. For growth of their business they are in process of Digital Marketing with help of Face Book, Twitter & Youtube Marketing Being Digital Marketing Executive how will you create and promote their Digital Marketing platform. **[10]**

Q2) Explain various tool of Social Media and Digital Marketing. **[10]**

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

Q4) What is search engine optimization? Explain off page optimization concepts. **[10]**

Q5) Explain SWOT analysis of business. **[10]**

Q6) What is search engine marketing? Explain various tools used for it. **[10]**

Q7) Explain the new trends in Digital Marketing. **[10]**

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

a) PPC
b) SEO Tools
c) PPC (Pay Per Click)

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Total No. of Questions : 7]

SEAT No. :

PD1714

[Total No. of Pages : 1

[6432]-502
T.Y.M.C.A. (Management)
IT52 : MOBILE APPLICATION DEVELOPMENT
(2019 Pattern) (Semester-V)

Time : 3 Hours] *[Max. Marks : 70*

Instructions to the candidates:

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

Q1) Explain IOS architecture in detail with the help of diagram. **[10]**

Q2) What is layout? Explain Linear layout & Relative layout with the help of example. **[10]**

Q3) What is dialog & its different types? Design an android application using one type of dialog. **[10]**

Q4) Design an android application for taking appointment in the Hospital. Write an android code to store & retrive appointment details by using SQlite. (Assume suitable table structure). **[10]**

Q5) Explain web services. Design an android application that accepts a web URL address as input from user & displays the corresponding web page. **[10]**

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

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

a) React Native

b) Flutter Architecture

c) Activity life cycle

d) Adapters

e) ADB & DVM

Total No. of Questions : 6]

SEAT No. : ____

PD1715

[Total No. of Pages : 2

[6432]-503

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

IT 53 : 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 indicate full marks.***

Q1) Attempt the following (Any 4) **[4×5=20]**

a) Explain Delphi estimation technique.
b) Explain the agile concept–Story point.
c) Explain Product Vision and its components with an example
d) What is rapid application development
e) What is the difference between agile and waterfall?
f) Short Note on MS Project.

Q2) A project size of 200 KLOC is to be developed. Software development team has average experience on similar type of projects. The project schedule is not very tight. Calculate the Effort, development time, average staff size, and productivity of the project. **[10]**

OR

a) Explain Value driven development in brief. **[5]**
b) Explain importance RISK management process. **[5]**

Q3) We are embarking on Project A, which involves developing a semi-detached software with a size of 32,000 DSI (Delivered Source Instructions). The software falls into a mission-critical area, requiring a high level of reliability (RELY=high=1.15). We need to estimate the effort, schedule, productivity, and average staffing for the project based on the given information. **[10]**

OR

a) What is Function point analysis? **[5]**
b) What is Defect management Process? **[5]**

P.T.O.

Q4) Analyzing a software project, ode 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]**

OR

a) Explain Product Backlog and describe the factors considered for its item prioritization? **[5]**

b) Explain types of Agile reports in brief. **[5]**

Q5) a) Explain in brief product roadmap **[5]**

b) Write short note on - COCOMO model **[5]**

OR

a) What is the user story in agile? **[5]**

b) Explain difference between CPM &PERT. **[5]**

Q6) As a member of the Agile development team for online shopping application, create two user stories and define its acceptance criteria (in GIVEN/WHEN/THEN format) for a specific feature, User registration and login. **[10]**

OR

a) Explain in details various phases of project management life cycle. **[5]**

b) Explain Product Prioritization. **[5]**