Total No. of Questions : 5]

SEAT No. : ____

PC-3227

[Total No. of Pages : 2

[6383]-101
F.Y. 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 use of 'super' keyword in constructor chaining with suitable example. **[7]**

b) Explain the use of 'Finalize' keyword. **[3]**

OR

c) Define recursion? Write a program to print factorial of a number using recursion. **[7]**

d) Differentiate between 'Public', 'Private' and 'default' access specifiers'. **[3]**

Q2) a) Write a program to create two threads, one thread will print odd numbers and second thread will print even numbers between 1 to 10 numbers. **[5]**

b) Explain types of Exception. **[5]**

OR

c) Write a program to sort given numbers. **[5]**

d) Differentiate between string and string buffer. **[5]**

Q3) a) What is Arraylist? Explain with example. **[5]**

b) Explain Map collection in detail. **[5]**

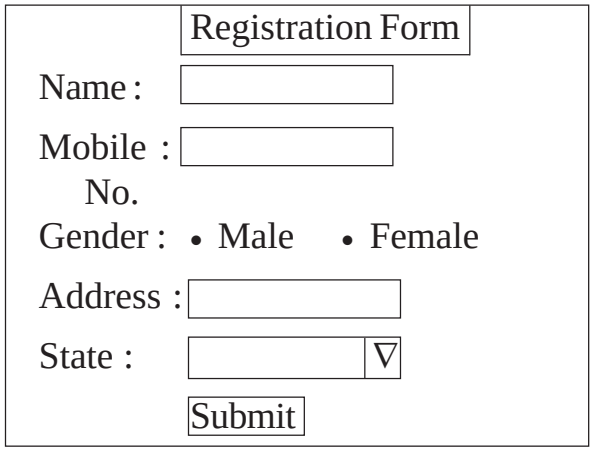
OR

c) Write a program to find an element in Tree set. **[5]**

d) Explain stack collection in detail. **[5]**

P.T.O.

Q4) a) Design the following GUI using AWT/Swing. **[10]**



Note : State field must be dropdown menu.

OR

b) Explain Window listener. Implement all the methods of it. **[10]**

Q5) a) Create a Table 'student' having fields are student-ID, Name, Course, Fees. Perfrom CRUD operations on student table (using JDBC) **[10]**

OR

b) Create Servlet to find power of n. **[10]**

Total No. of Questions : 5]

SEAT No. :

PC-3228

[Total No. of Pages : 2

[6383]-102

M.C.A. (Management)

IT-12 : DATA STRUCTURE AND ALGORITHMS

(Rev.2020) (Semester - I)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates :

1) ***All questions are compulsory.***
2) ***figures to right indicate full marks.***

Q1) a) Write an algorithm to reverse the nodes from doubly linked list. **[6]**

b) Write an algorithm to delete element from circular queue. **[4]**

OR

a) Write an algorithm to calculate sum of first and last nodes data in SLL. **[6]**

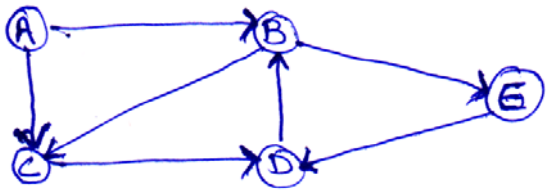
b) Write any four application of stack. **[4**

Q2) a) Construct BST with following traversal **[6]**

i) Inorder traversal 10, 12, 15, 20, 30, 57, 100, 300

ii) Postorder traversal 12, 15, 10, 30, 20, 300, 100, 57

b) Write BFS and DFS following Graph [starting node B]. **[4]**



OR

a) Construct Red-Black Tree for following data 8, 15, 5, 15, 17, 25, 40. **[6]**

b) Explain Min heap with suitable example. **[4]**

P.T.O.

Q3) a) Apply Rain Terace algorithm to following Problem Input : [3, 4, 1, 5, 2, 6] Draw the figure and find solution. **[6]**

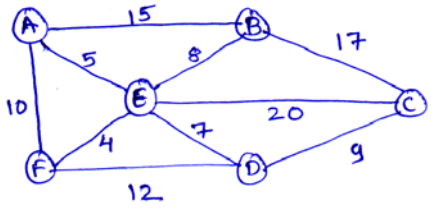
b) Explain Hamitonian cycle with suitable example. **[4]**

OR

a) Apply the maximum subarray algorithm to the Input arr = [–2, –5, 6, –2, –3, 1, 5, –6] and find sum of maximum subarray. **[6]**

b) Discuss Rules for Knight's tour problem. **[4]**

Q4) a) Apply Prim's algorithm to solve following graph. **[6]**



b) Write the steps for Tower of Hanoi for 3 disks. **[4]**

OR

a) Sort the following data using Quick sort 24, 11, 31, 16, 21, 29, 05. **[6]**

b) What is the use of Euelidean Algorithm? Explain with example. **[4]**

Q5) a) Find the largest common subsequence for the following string using Dynamic Programming. **[7]**

x = {A, B, D, B}

y = {C, B, D, A}

b) Write a short note on Regular Expression matching. **[3]**

OR

a) Consider the given instance of 0/1 Knapsack problem. **[7]**

N = 4, M = 8 P = (2, 3, 1, 4) R W = (3, 4, 6, 5) using dynamic programing. Determine the optional profit & solution vector.

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

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Total No. of Questions : 5]

SEAT No. : ____

PC3229

[6383]-103

[Total No. of Pages :2

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 system Development model. **[5]**

b) Describe Web Engineering process. **[5]**

OR

a) Explain Rapid Application Development model. **[5]**

b) Describe Adaptive Software Development (ASD) process. **[5]**

Q2) Prepare SRS as per IEEE format for G20 Summit Management system. The overall functioning is as follows: **[10]**

a) G20 members registration

b) G20 members invitation

c) Schedule preparation

d) Expenses tracking for the G20 Summit

OR

Prepare SRS as per IEEE format for online food ordering system. **[10]**

Q3) Minister of Education is organising smart India Hackathon for developing innovative culture in the institute. Draw use-case diagram and class diagram for below task- **[10]**

a) Team registration

b) Selecting problem statements

c) Evaluating idea

d) Nominating the team

OR

Draw activity diagram and sequence diagram for registering complaint about cybercrime. **[10]**

P.T.O.

Q4) a) Design GUI form by using appropriate UI design elements for Real Estate portal. **[5]**

b) Draw state transition diagram for fully automatic washing machine. **[5]**

OR

a) Design GUI layout for participating in a university hosted inter-college Tech festival competition. **[5]**

b) Draw collaboration diagram for blood donation system. **[5]**

Q5) Write Short Note (Any two): **[2×5=10]**

a) Abstraction and encapsulation

b) Aggregation and composition

c) Agile principles (any five)

Total No. of Questions : 5]

SEAT No. : ____

PC3230

[Total No. of Pages : 2

[6383]-104

First Year M.C.A. (Management)

IT-14 : OPERATING SYSTEM CONCEPTS

(Revised 2020 Pattern) (Semester - I)

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

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Draw the diagram wherever necessary.***

Q1) a) What is paging. Explain with neat Diagram. **[5]**

b) Explain process control Block with neat Diagram. **[5]**

OR

a) Explain segmentation in Detail. **[5]**

b) Explain Any 2 CPU scheduling Algorithms. **[5]**

Q2) a) State & explain the Applications of Distributed operating system. **[5]**

b) What is multicare operating system. What are it's advantages. **[5]**

OR

a) What is cache coherance and Interprocess Communication. **[5]**

b) Explain the different features of Android operating system. **[5]**

Q3) a) What is RTOS. Explain types of RTOS. **[5]**

b) Explain file system used in windows operating system. **[5]**

OR

a) What are different Applications of Embedded operating system. **[5]**

b) Explain below linux commands with example. **[5]**

i) ls

ii) cat

iii) pwd

iv) rm

v) grep

P.T.O.

Q4) a) Write a schell script to display sum of first ten natural numbers using while loop. **[5]**

b) Explain different types of shells available in Linux. **[5]**

OR

a) Write a shell script to accept three numbers and calculate it's average. **[5]**

b) State and explain the features of Ubuntu. **[5]**

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

a) Synchronization.

b) Virtual memory.

c) Non-Uniform memory Access.

d) Backup & Recovery in Ubuntu.

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Total No. of Questions : 5]

SEAT No. : ____

PC-3231

[Total No. of Pages : 2

[6383]-105

M.C.A. (Management)

IT - 15 : 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 unguided transmission media in detail. **[4]**

b) Explain the need of Layering in OSI model with suitable example. **[6]**

OR

a) Explain unified communication (VOIP).

b) Explain TCP/IP model in detail.

Q2) a) Compare IPV_4 and IPV_6 packet formats. **[4]**

b) The received codeword is 1100100101011, check if there is error in the code if the divisor is 10101. **[6]**

OR

a) For the given class C IP address - 192.168.38.1 and the subnet mask 255.255.255.240 calculate

i) Total number of subnets

ii) Total number Host IPs/subnet

iii) Total number of valid Host IPs/subnet

iv) First and last valid IP for each subnet.

b) Describe HDLC protocol with its subtypes and frame format.

P.T.O.

Q3) a) Find the maximum number Hosts available on class B IP Address with subnet mask 255.255.255.224. Also find maximum number of subnets available. **[4]**

b) Explain any two error correction techniques with suitable example. **[6]**

OR

a) Describe TCP connections.

b) Generate the hamming code for the data 1 1 0 0 1 1 1 0 with even parity.

Q4) a) What is Firewall? Describe types of firewall. **[4]**

b) What is HTTP? Explain HTTP transaction in detail. **[6]**

OR

a) Explain types of security attacks in detail.

b) Explain DHCP scope resolution in detail.

Q5) a) Explain RIP protocol in detail. **[4]**

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

OR

a) Explain IGP and EGP in detail.

b) What is socket? Write a simple socket program to find out IP address of host.

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Total No. of Questions : 5]

SEAT No. : [ ]

PC-3232

[Total No. of Pages : 2

[6383]-201

M.C.A. (Management)

IT - 21 : PYTHON PROGRAMMING

(Rev. 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) a) Write a program to check the number entered by user is even or odd. Program should accept integer only. **[5]**

b) Explain lamda function with sutaible example. **[5]**

OR

c) Write a program to check if the input year is leap year or not. Validate the input. **[5]**

d) Explain any five sting function with example. **[5]**

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

b) Write a multithreading program, where one thread prints square of a number and another thread prints factorial of a number. **[5]**

OR

c) Write a program for extracting email address from a given string. **[5]**

d) Explain thread synchronization with sutaible example. **[5]**

P.T.O.

Q3) a) Explain constructor & distructor with example. **[5]**

b) Write a Python Class called 'Car' that represent a Car. Include attributes such as 'make', model & year. Implement a method called 'display-info' that print out the details of the Car. Then, create instance of the 'Car' class and call the 'display-into ()' method for each instance to display their details. **[5]**

OR

c) Explain types of inheritance with suitable example. **[5]**

d) Write a Python program to create a class representing a shopping cart. Include methods for adding & removing items and calculating the total price. **[5]**

Q4) a) Write a program to retrieve and display teacher details from "Teacher" collection stored in MongoDB database. **[5]**

b) Write a program to reverse each word of given file ("data. txt"). **[5]**

OR

c) Write a Python program using mongo DB to register students for project presentation competition. With fiels (std-id, std-name, project topic, std-phone) and display all registration. **[5]**

d) Compare SQL vs NoSQL. **[5]**

Q5) a) Discuss the significance of Numpy in data Analysis. **[5]**

b) Create Pandas data frame using 2 dimensional list. Perform following operations. **[5]**

i) Count number of rows

ii) Count missing values in first column.

iii) Display number of columns in data frame.

OR

c) Create 3×3 numpy array and determine median and mode. **[5]**

d) Draw bar graph using matplotlib and decorate it by adding various elements. **[5]**

▽▽▽▽

Total No. of Questions : 5]

SEAT No. :

PC-3233

[Total No. of Pages : 3

[6383]-202
F.Y.M.C.A.
MANAGEMENT
IT 22 : Software Project Management
(Revised 2020 Pattern) (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) Explain different software risks and how to manage them. **[6]**

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

OR

c) A manufacturing company of an industrial belt decided to develop an ERP through Eklavya software solutions. The output of the system will be a cost sheet detailing the relevant information for contracting, budgeting process monitoring and bill payment. Eklavya software solutions has no domain knowledge. As a project manager, you have been asked to suggest risk management strategy after identifying the risks solve the case study. **[6]**

d) Explain various Agile Tools. **[4]**

Q2) a) Consider a project with the following functional units **[6]**

i) Number of user inputs : 16
ii) Number of user outputs : 22
iii) Number of user inquries : 10
iv) Number of user files : 16
v) Number of external interfaces : 20

In addition to the above, system requires significant Data communication **[5]**

Performance is very critical **[3]**

Designed code may be moderately Revsable **[4]**

Complex processing **[4]**

Other complexity factors are treated as average

Compute the functional point for the project. **[4]**

P.T.O.

b) Write short note of MS-project Tool. **[4]**

OR

c) A project of 300 KLOC is to be developed. Software development team has average experience on similar type of projects. The project scheduel is not very right. Calculate the effort, development time, average staff size of the project by using semi - detached mode of cocomo model.**[6]**

d) Write short note on CMM. **[4]**

Q3) a) Demonstrate value Driven Development with example. **[6]**

b) What is FPA? Explain various steps in FPA. **[4]**

OR

c) "Anand Holidays", One of the distinguished service providers of International Tours & Travel. Due to their reliable and flexible services, they have earned a large number of customers across the nation. They want to upgrade their ERP. As a product owner you have to identify all possible epic, features and user stories for the some. **[6]**

d) Explain steps in Delphi cost estimation Technique. **[4]**

Q4) a) Consider a project with the following -

Suppose that a project was estimated to be 500 KLOC calculate the effort and development time for all three modes ie, organic, semi-detatched & embedded. **[6]**

Software project	a_b	b_b	c_b	d_b
Organic	2.4	1.05	2.5	0.38
Semi - Detached	3	1.12	2.5	0.35
Embeded	3.6	1.2	2.5	0.32

b) How to facilitate retrospective process in Agile management with suitable example. **[4]**

OR

c) Explain the four values of Agile manifesto with its meaning. **[6]**

d) Explain product Backlog & sprint Backlog. **[4]**

Q5) a) Explain role & responsibilites of project manager **[6]**

b) What are the components of function point Analysis **[4]**

OR

Write short note on

i) Github **[5]**

ii) Swim lanes **[5]**

Total No. of Questions : 5]

SEAT No. : ____

PC3234

[6383]-203

[Total No. of Pages :2

First Year M.C.A. (Management)

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) ***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

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

d) Explain various types of filters in Angular with example. **[5]**

P.T.O.

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. :

PC3235

[Total No. of Pages :2

[6383]-204

First Year M.C.A. (Management)

IT24 : ADVANCED DBMS

(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 indicates full marks.***

Q1) Case study :-

XYZ hospital is a multi-specialty hospital the includes a number of departments rooms . Doctors ,nurses , compounders , and other staff working in the hospital . Patients having different kinds of ailments came to the hospital and get checkup done , from the concerned doctors . If requiare They are admitded in the hospital & discharged after treatment . The aim of this case study is to design and develop a database for the hospital to maintain the records of various department , rooms, & doctors in the hospital . It also maintains records of the regular patients , patients admitted in the hospital the checkup of patients done by the doctors .The patients that have been operated and patients discharged from the hospital .

Draw the E.R diagram for the above system and example the all notation & relationship. **[8]**

OR

Use above case study and Normalize above data upto 3 NF. **[8]**

Q2) a) What are the characteristics of the DBMS ? Explain data Independency. **[5]**

b) Compare RDBMS, OODBMS & ORDBMS . **[5]**

OR

a) Describe the three schema architecture of DBMS. **[5]**

b) Explain the multimedia database with its architecture . **[5]**

P.T.O.

Q3) a) What are the various failure classification in details? **[5]**

b) Explain different types of Access control in database security. **[5]**

OR

a) Write a short note on Remote Backup systems. **[5]**

b) Explain the Grant & Revoke privilege. **[5]**

Q4) a) Check whether the given schedules is conflict serializable or not if yes then determine all the possible serialized schedule.

S: $R_1(A)$,$R_2(A)$, $R_1(B)$, $R_2(B)$, $R_3(B)$, $W_1(A)$,$W_2(B)$ **[6]**

b) Write the type of No-SQL Database . **[2]**

OR

a) Check whether the given schedule S is conflict serializable or not , if yes then determine all the possible serialized schedule .

S : $W_1(B)$, $R_2(A)$,$W_2(A)$,$W_2(B)$,$R_3(A)$,$R_3(B)$, $R_4(A)$ **[6]**

b) What is the need of No-SQL Database? **[2]**

Q5) a) What do you mean by inter - operation and intra operation parallelism in details? **[7]**

b) Explain the distributed database Architecture in details with diagram . **[7]**

OR

a) Explain the parallel database architecture in details with diagram . **[7]**

b) Explain the any two concurrency control approaches in DDBMS in details. **[7]**

Total No. of Questions : 5]

SEAT No. : ____

PC-3236

[Total No. of Pages : 5

[6383]-205
F.Y.M.C.A.
MANAGEMENT
MT 21 : Optimization Techniques
(2020 Pattern) (Semester - II)

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

Instructions to the candidates :

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

Q1) a) Solve the following LPP using Simplex Method **[10]**

Min $Z = X_2 - 3X_3 + 2X_5$

Subject to ,

$3X_2 - X_3 + 2X_5 \leq 7$

$-2X_2 + 4X_3 \leq 12$

$-4X_2 + 3X_3 + 8X_5 \leq 10$

$X_2, X_3, X_5 \geq 0$

OR

b) Solve the following LPP using TWO Phase method **[10]**

Max $Z = 5X_1 - 4X_2 + 3X_3$

Subject to,

$2X_1 + X_2 - 6X_3 = 20$

$6X_1 + 5X_2 + 10X_3 \leq 76$

$8X_1 - 3X_2 + 6X_3 \leq 50$

Where, $X_1, X_2, X_3 \geq 0$

Q2) a) In certain market, only two brands of cold drinks A, B are sold. Given that a man has last purchased brand A, there is 80% chance that he would buy same brand A in next purchase. While if man purchase brand B, there is 90% chance that he would buy same brand B in next purchase. **[7]**

i) develop transition probability matrix,

ii) Interpret state transition matrix in terms of

A) retention & loss

B) retention and gain

iii) Draw transition diagram.

P.T.O.

b) Find the optimum strategies of the player in the following game, also find :**[3]**

i) Value of game

ii) Optimum strategy for player A Optimum Strategy for Player B

			B	
		B1	B2	B3
A	A1	2	8	4
	A2	7	10	6
	A3	3	5	4

OR

c) A bakery keeps records of a popular brand of cake. **[7]**

Daily Demand	0	15	25	35	45	50
Probability	0.01	0.15	0.20	0.50	0.12	0.02

Given set of Random number are 48,78,09,51, 56,77, 15, 14,68 and 09

i) Using these sequence simulate demand for next 10 days.

ii) Also find stock situation if owner made 35 cakes/day.

iii) Also find Average daily demand on the basis of simulated data.

d) Solve following game problem using equal game method, also find **[3]**

i) Value of game

ii) Optimum strategy for player A

iii) Optimum Strategy for Player B

		B	
		B1	B2
A	A1	4	1
	A2	2	3

Q3) a) Suppose 4 jobs (A to D) need to be processed on Machine Ml, M2, M3,M4 & M5 in a same processing sequence. Identify best job sequence that will reduce idle time (in Minutes) of all machines, elapsed time, idle time of all machines **[7]**

Job	M1	M2	M3	M4	M5
A	7	5	2	3	9
B	6	6	4	5	10
C	5	4	5	6	8
D	8	3	3	2	6

b) For a given payoff matrix, Suggest optimum strategy using- **[3]**

i) Criteria of Optimism

ii) Criteria of Pessimism

		Events			
		N1	N2	N3	N4
Strategies	S1	1000	1500	750	0
	S2	250	2000	3750	3000
	S3	-500	1250	3000	4750
	S4	-1250	500	2250	4000

OR

c) Five jobs are to be processed through 3 machines Ml, M2 & M3. Processing times is in hours. Find best job sequence, elapsed time and idle times for all Machines **[7]**

Job	M1	M2	M3
A	8	5	4
B	10	6	9
C	6	2	8
D	7	3	6
E	11	4	5

d) For a given Cost matrix, Suggest optimum strategy using- **[3]**

i) Hurwitz Criterion (Alpha = 0.6)

ii) Savage Criterion

		Events			
		N1	N2	N3	N4
Strategies	S1	1000	1500	750	0
	S2	250	2000	3750	3000
	S3	-500	1250	3000	4750
	S4	-1250	500	2250	4000

Q4) a) A project consists of Ten activities whose time estimates and others characteristics are given below : **[10]**

Activity	Predecessor	Durations (Week)		
		Optimistic time	Most Likely time	Pessimistic time
A	-	5	6	7
B	-	1	3	5
C	-	1	4	7
D	A	1	2	3
E	B	1	2	9
F	C	1	5	9
G	C	2	2	8
H	E,F	4	4	10
I	D	2	5	8
J	H,G	2	2	8

Draw the network diagram and find the critical path, Also Find project completion time and project variance

OR

b) The following is the data regarding a project : **[10]**

i) Draw the network and identify the critical path with double line.

ii) What are the normal project duration and the associated cost? And Find the total float associated with each activity.

Activity	Predecessor	Normal	
		Time (weeks)	Cost (Rs.)
A	-	10	2000
B	-	8	1500
C	B	5	1000
D	B	6	1100
E	B	8	900
F	E	5	500
G	ADC	12	300

Q5) a) A grocer must decide how many crates of milk should be stocked each week to meet the demand. The probability distribution of demand is as under. **[7]**

- Each crate costs the grocer Rs. 100 &
- Its selling price is Rs. 120,
- Unsold crates are sold to a local farmer for Rs. 20 per crate.
- If shortage exist, a shortage cost of Rs. 40 per crate incurred

Construct a matrix and calculate EVM, EPPI & EVPI

Demand	15	16	17	18	19
Probability	0.15	0.25	0.40	0.15	0.05

b) Write short note on **[3]**

i) Fulkerson Rule of Numbering

ii) Dummy Activity

OR

c) Rainfall distribution in monsoon season as follows **[7]**

Rain in cm	0	1	2	3	4	5
Probability	0.50	0.25	0.15	0.05	0.03	0.02

Simulate the rainfall for 10 days using following random numbers 44, 66, 87, 23, 98, 6, 12, 67, 34 and 23.

i) Using these sequence simulate demand for next 10 days.

ii) Also find Average rainfall on the basis of simulated data.

d) Write short note on **[3]**

i) Pure strategy Game

ii) Feasible Solution

♦ ♦ ♦

Total No. of Questions : 5]

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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 labeled diagram wherever necessary.***

Q1) a) Explain IOS architecture with diagram. **[10]**

OR

b) Explain Hybrid Architecture with diagram. **[10]**

Q2) a) Write an android code to capture image using camera, display in imageview **[10]**

OR

b) Write an android code to send sms "All the best for exams" using fragments. **[10]**

Q3) a) Explain with example JSON parsing **[5]**

b) Write an android code to turn ON/OFF the WiFi **[5]**

OR

c) Explain with example XML parsing **[5]**

d) What is Array Adapter with suitable example. **[5]**

Q4) a) Write sqlite code to add candidate list under particular constituency. Display constituency wise. Candidate name (Database column includes-candidate name, conctituency name, symbol, partyname) **[10]**

OR

b) Create an Android app using firebase database for cinema hall to show different movies on different time slots on different screens, assume suitable table structure. **[10]**

P.T.O.

Q5) a) Write react native code to locate device using Geolocation API. **[5]**

b) Wrie Flutter code to display phone contact list **[5]**

OR

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

i) Javascript ES6

ii) Dart Programming

iii) Web view

Total No. of Questions : 5]

SEAT No. :

PC3238

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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 labelled diagram wherever necessary.***

Q1) a) Define data warehouse. Explain Top-Down and Bottom-Up approach of datawarehouse. **[5]**

b) Explain different data warehouse schemas with example. **[5]**

OR

c) Differentiate OLTP & OLAP **[5]**

d) Explain different components of data warehouse **[5]**

Q2) a) Explain data cleaning tasks in ETL data preprocessing. **[5]**

b) Brief different ETL tools in detail. **[5]**

OR

c) Explain data extraction methods with example. **[5]**

d) Write a note on concept Hierarchy generation. **[5]**

Q3) a) What is OLAP? Explain architecture of OLAP. **[5]**

b) Explain Datamining architetcture with neat daigram. **[5]**

OR

c) Perform OLAP operations on data cube. **[5]**

d) Compare datamining and data warehouse. **[5]**

P.T.O.

Q4) a) Consider the following Itemset & apply FP-Tree algorithm to final frequent patterns. **[5]**

IID	Items
i)	A, B, C, X, Y
ii)	X, Y, Z, C
iii)	A, C, D, E, X, Y, Z
iv)	A, B, C, D, E
v)	A, B, C, X, Y
vi)	A, B, X, Y, D, E
vii)	X, Y, Z, E, C
viii)	A, B, C, D, X

Find any five patterns. Consider minimum support count = 2.

b) Consider above itemset (***Q4***. a) to calculate support & confidence of following rules. **[5]**

i) $\{A, B\} \rightarrow \{C\}$

ii) $\{X, Y\} \rightarrow \{Z\}$

iii) $\{E\} \rightarrow \{C, D\}$

iv) $\{A\} \rightarrow \{C\}$

v) $\{B, C\} \rightarrow \{D\}$

OR

c) From the given dataset, find $(x,y) = 172, 58$ whether belongs to under or normal weight. Using KNN algorithm. **[5]**

Height (x)	Weight (y)	Class
169	53	Under weight
183	63	Normal
178	71	Normal
174	65	Normal
170	63	Normal
169	51	Under weight
175	62	Normal
172	56	Normal
173	58	Normal
172	58	?

d) Explain SVM algorithm with example. **[5]**

Q5) a) Consider following data points & apply K-means clustering. **[5]**

[20, 27, 32, 33, 42, 41, 23, 21, 34, 35, 38, 43, 44, 50, 52, 16]

K = 2 $C_1 = 32$ $C_2 = 44$

b) Explain web content mining in detail. **[5]**

OR

c) Consider the following data set & apply K-means clustering algorithm. **[5]**

D = [0.5, 0.6, 0.8, 0.10, 0.12, 0.11, 0.9, 0.22, 0.21, 0.23, 0.24, 0.19, 0.18, 0.17, 0.18, 0.20]

K = 2 $C_1 = 0.5$ $C_2 = 0.18$

d) State different web mining applications. **[5]**

Total No. of Questions : 5]

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

IT33: SOFTWARE TESTING AND QUALITY ASSURANCE

(Revised 2020 Pattern) (Semester - III)

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

Instructions to the candidates:

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

Q1) Write a detailed test plan for a web based medical application 'Doctor Online'. The application is meant for those patients who can consult doctors online, or can find out medicines for minor problems or at time to arrive at diagnosis based on symptoms. Applications can be used by expert doctors to cross check their diagnosis. Also, they can register to the application for sharing their expertise & provide consultancy online. The application is expected to work on various platforms including browsers. It should be scalable enough to handle large number of users. Application is expected to be online 24×7. Some medico legal aspects need to be taken into consideration through the site (eg. confidentiality of patient's information). The payment gateway is developed by third party. This type of application will be tested for the first time by the testing team which includes few freshers also. Application, in its next version, will have a module for 'Global News', which is not yet fully understood & in the process of development, hence will be tested in next round of testing. Application has facility for tracking the position of different near by hospitals through a GPS. **[10]**

OR

Write detailed test cases for cash withdrawal & deposit process of an ATM. **[10]**

Q2) a) Define software quality assurance. Also explain SQA activities. **[5]**

b) Define quality. Explain McCall's quality factor model in detail. **[5]**

OR

a) Define software quality assurance. Also explain ISO 9000 & six sigma. **[5]**

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

P.T.O.

Q3) a) Define testing. Explain seven testing principles in detail. **[5]**

b) Explain various levels of testing in detail. **[5]**

OR

a) Explain verification & validation model. **[5]**

b) State & explain in detail functional & non-functional testing types. **[5]**

Q4) a) What is review? Explain inspection process & its various roles. **[5]**

b) State & explain black box testing & its different techniques in detail. **[5]**

OR

a) Compare data flow & control flow analysis. **[5]**

b) What is experience based testing? Define error guessing & exploratory testing. **[5]**

Q5) Write short notes. (Any 2) **[10]**

a) CAST

b) Selenium

c) Appium

d) Project & product risk

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Total No. of Questions : 5]

SEAT No. :

PC3240

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

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

(Revised 2020 Pattern) (Semester-III)

Time : 2½ Hours] *[Max. Marks : 50*

Instructions to the candidates:

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

Q1) a) Discuss AND-OR graph with example. **[5]**

b) Demonstrate Random-Forest algorithm with example. **[5]**

OR

c) Describe types of knowledge in AI. **[5]**

d) Explain in brief dimensionality reduction and feature selection. **[5]**

Q2) a) Using FOPL **[6]**

i) Geeta likes all kinds of food.

ii) Mango and chapati are food.

iii) Geeta eats almond and is still alive.

iv) Anything eaten by anyone and is still alive is food.

Prove that - Geeta likes almond.

b) Construct the truth - table for the following. **[4]**

i) $(P \wedge q) \wedge \sim (p \vee q)$

ii) $\sim (p \wedge q) \leftrightarrow (\sim p \vee \sim q)$

OR

P.T.O.

c) Write FOL of following statement. **[6]**

i) All students are smart.

ii) Naresh has at most one sister.

iii) Not all cars have carburettors.

iv) Every number is either negative or has a square root.

v) Not every graph is connected.

vi) Every one is loyal to some one.

d) Test the validity of the following arguments: **[4]**

If I like Mathematics then I will study.

Either I don't study or I pass Mathematics.

If I don't graduate, then I don't pass Mathematics.

Therefore, If I like mathematics, then I will graduate.

Q3) a) Illustrate support vector machine for positively labelled data points (2, 2) (2, –2), (–2, –2) (–2, 2) & negatively labelled data points (1, 1) (1, –1) (–1, –1) (–1, 1) Apply SVM algorithm to classify these data points. **[6]**

b) Differentiate between machine learning and statistical learning. **[4]**

OR

c) Consider the given Data set. Apply Naive Baye's algorithm and predict that if a fruit has the following properties then which type of the fruit it is. **[6]**

Fruit = {Yellow, Sweet, Long}

Frequency table.

Fruit	Yellow	Sweet	Long	Total
Mango	350	450	0	650
Banana	400	300	350	400
Other	50	100	50	150
Total	800	850	400	1200

d) Explain qualitative and quantitative data in detail. **[4]**

Q4) a) Find TFIDF for the following table. **[6]**

	W_0	W_1	W_2	W_3	W_4	W_5
r_0	1	0	0	1	0	0
r_1	1	1	1	0	0	0
r_2	1	0	0	0	1	1
r_3	1	0	0	1	0	1
r_4	1	0	0	1	0	0

Find TFIDF of:

i) $(r_1\ w_3)$ &

ii) (r_0, w_2)

b) Define & explain activation function. **[4]**

OR

c) By using 5×5 input and 3×3 kernal/filter find the output of the following CNN problem. **[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

5×5

0	–1	0
–1	5	–1
0	–1	0

3×3

Q5) a) Explain Recurrent Neural network in detail. **[5]**

b) Describe the use of AI in Image Processing. **[5]**

OR

c) Explain the architecture of ANN. **[5]**

d) Discuss the concept of edge computing. **[5]**

Total No. of Questions : 5]

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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 indicates full marks.***

Q1) a) Define cloud computing? Explain characteristics of cloud computing. **[5]**

b) Explain cluster computing with example. **[5]**

OR

a) Write short note on Xaas with example. **[5]**

b) Explain cloud service models in brief. **[5]**

Q2) a) Explain virtualization in brief. **[5]**

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

OR

a) Explain advantage and disadvantages of virtualization. **[5]**

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

Q3) a) What is SOA? Explain the relations between Cloud Computing and Service Oriented Architecture. **[10]**

OR

b) Write down difference between SOAP and REST. **[10]**

P.T.O.

Q4) a) Analyze that multicloud is more beneficial than any cloud service provider explain with proper example. **[10]**

OR

b) Write a short note on. **[10]**

i) Parallel processing

ii) Parallel programing

Q5) a) What is Data Migration? Suggest the various issues in inter cloud computing. Discuss cloud migration process. **[10]**

OR

b) Write a short note on. **[10]**

i) Identity management and Access control

ii) Dockers container

Total No. of Questions : 5]

SEAT No. : ____

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

421-IT41: DEVOPS

(Revised 2020 Pattern) (Semester - IV)

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

Instructions to the candidates:

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

Q1) a) Explain 7C's of Devops with suitable diagram. **[5]**

b) Differentiate between CVCS and DVCS. **[5]**

OR

c) Write RPM installation in detail. **[5]**

d) What is github? Explain importance of using github. **[5]**

Q2) a) How to add Run List to Node in chef configuration management. Also check node details. **[10]**

OR

b) Write and explain, different phases of Maven build life cycle. **[10]**

Q3) a) Explain Docker Networking for. **[5]**

i) Accessing containers.

ii) Linking containers.

b) Explain in detail, Installation of Docker on Linux. **[5]**

OR

c) Explain the methods to upload the images in docker registry and AWS. **[5]**

d) Explain Docker Architecture with suitable diagram. **[5]**

P.T.O.

Q4) a) Explain chef components in detail. **[5]**

b) What are different types of Maven repository. **[5]**

OR

c) Explain the use of knife in chef. **[5]**

d) Explain Maven plugins. **[5]**

Q5) a) Explain SDLC models, Lean and Agile in Detail. **[5]**

b) How to create repository in Git? Explain. **[5]**

OR

c) Explain any 5 Linux commands with correct syntax and suitable example. **[5]**

d) Explain branching in Git. **[5]**

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Total No. of Questions : 5]

SEAT No. : [ ]

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

422-BM 41: PRINCIPLES AND PRACTICES OF MANAGEMENT AND ORGANIZATIONAL BEHAVIOR

(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) Summarize the scope, need and process of management. **[5]**

b) Compare Scientific Management by Taylor, Administrative Management by Fayol, and Contribution of Peter Drucker. **[5]**

OR

a) Classify the Social responsibilities of management in detail with suitable diagram. **[5]**

b) Summarize the MIS approach of management with advantages and disadvantages. **[5]**

Q2) Analyze the various Leadership styles. Being Project manager in multinational IT company how you can implement the leadership styles with your employees. **[10]**

OR

Mr. Surendra B. is a renowned entrepreneur who has built a successful tech start up from scratch. Being a successful entrepreneur justify how Maslow's need Hierarchy is applied to his life. **[10]**

Q3) Being a Project manager analyse the types and sources of stress management. When you and your team is having project deployments and timelines how you can resolve the stress for the same. **[10]**

OR

Analyze the stress in personal and professional life. Being a successful person in reputed organization relate how Yoga, Meditation and Physical Fitness is helpful for the stress management. **[10]**

P.T.O.

Q4) GigaTech is a leading IT company, Analyze the types of teams and how the company implements team-building strategies to nurture teamwork, innovation, and employee engagement. **[10]**

OR

Develop Johari window for following case study
ABC Consulting is a dynamic consulting firm with a diverse team of consultants working on various projects. The company values effective communication and recognizes that improving self-awareness and interpersonal relationships is crucial for project success. The management decides to implement the Johari Window model as a tool to achieve these goals. Justify your views about companies' decision. **[10]**

Q5) a) Illustrate the various types of decisions in detail with example. **[5]**

b) Categorize the types of Corporate Culture and discuss it in detail. **[5]**

OR

a) Compare decision making under certainty, under uncertainty and under risk. **[5]**

b) Describe the various levels of organizational culture in detail with diagram. **[5]**

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