

Total No. of Questions : 7]

SEAT No. :

PA-2528

[Total No. of Pages : 3

[5948]-11

M.C.A. (Management)

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) *All questions carry 10 marks each.*

- Q1)** a) Write an algorithm for sum of n natural numbers. [5]  
b) Explain Dynamic Programming algorithmic Paradigms. [5]

- Q2)** a) Write a C++ program to find the cube of given number using inline function. [5]  
b) What is concept of function overloading in C++? [5]

OR

- a) Write a function Simple\_interest (amount, duration, rate) to calculate simple interest with default variable of rate as 12%. [5]  
b) What is difference between call by value and call by reference? [5]

- Q3)** a) Write a program to overload the operator \* to multiply 2 matrix object and return a new matrix object containing their multiplication result using class. [7]  
b) Which operators cannot be overloaded. [3]

OR

- a) Write a program to overload the operator + using friend function. (+ unary operator). [7]  
b) Rules for overloading operator using friend function. [3]

**P.T.O.**

**Q4)** a) Create a class person with data members PCode and PName. Derive two classes Account and Official from person. Class account contains members as Acno and balance, while official class contains members designation and experience. Further derive another class Employee from both Account and Official classes. Write C++ program to create and display information of the Employee. Use Concept of Virtual base class to implement Hybrid Inheritance. [7]

b) Write any 3 application of C++. [3]

OR

a) What is polymorphism? Explain how we can achieve run time polymorphism in C++ with example. [7]

b) What are advantages of C++ over C? [3]

**Q5)** a) Write a program to access the static variable using the scope resolution (::) operator. [7]

b) Explain logical operators in C++. [3]

OR

a) Why setBase(), setw(w) and setFill() are used in C++? [3]

b) Write a program for ::\* (Member Dereferencing operator) [7]

**Q6)** a) Create a class Array that contains one float array as member. Overload the Unary ++ and - - (minus minus) operators to increase or decrease the value of each element of an array. Overload both prefix and postfix operators. [8]

b) Explain insertion and extraction operators in C++. [2]

OR

- a) Define a class to represent employee. Include following. [8]

Data members: Employee code, Employee Name, Department, Basic Salary

Employee count for computer department (Static Member variable)

Employee count for Management Department (Static Member variable)

Member functions: To read employee details, To display employee data, to calculate net salary, to display employee count for computer and management department. (Static member function). Write a main program to test the class for handling N customers.

- b) Explain Copy constructor in C++. [2]

- Q7)* a) Write program for Tic Tac Toe. [8]

- b) Write short note on type cast operator. [2]

OR

- a) Write an application for Tower of Hanoi. [8]

- b) List down branching statements in C++. [2]



Total No. of Questions : 7]

SEAT No. :

PA-2529

[Total No. of Pages : 2

[5948]-12

**M.C.A. (Management)**

**IT 12 : SOFTWARE ENGINEERING USING UML**

**(2019 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** Road Insurance system has decided to provide automatic insurance to car Owners. **[20]**

- Customers are expected to fill up insurance report form.
- Agent sends drivers record request and vehicle registration request based on insurance request form to police and RTO respectively.
- Police sends drivers record report and RTO sends vehicle registration report.
- Insurance company sends policy contracts.
- The agent decodes the best suitable policy for customer and applies to respective company.
- Customer is informed about Insurance through insurance card.
- prepare software requirement specification in IEEE format.

**Q2)** “SEETANAGAR MUNICIPAL CORPORATION” has decided to computerise data regarding all the cinema theatres in the city. Theatre’s managers are requested to fill the form giving detailed information about the respective theatre. Design a layout of a form to be filled by the managers.

**P.T.O.**

[10]

- Q3)** Draw an activity diagram for online booking of movie tickets of movie in multiplex theatre. The payment should be done by credit card. The tickets can be cancelled 3 hours before the show timings. [10]
- Q4)** Draw use case diagram for hospital reception subsystem or module supports some of the many job duties of hospital receptionist. Receptionist schedules patients' appointments and admission to the hospital, collects information from patient upon patient's arrival and /or by phone for the patient that will stay in the hospital ("in patient") she or he should have a bed allotted in a ward. Receptionists might also receive patient's payments, record them in a database and provide receipts, file insurance claims and medical reports. [10]
- Q5)** Prepare a class diagram giving attributes and operations for both stack & queue implementation using linked list. [10]
- Q6)** What is adaptive software development process explain in details. [10]
- Q7)** Write a short notes on : (Any two) [10]
- a) Identify which is better waterfall model or spiral model?
  - b) Scrum
  - c) Elements of good design
  - d) State transition diagram.



Total No. of Questions : 7]

SEAT No. :

PA-2530

[Total No. of Pages : 2

[5948]-13

**M.C.A. (Management Faculty)**  
**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 five from Q2 to Q7.*
- 3) *Figures to the right indicate full marks.*

**Q1)** XYZ hospital has decided to computerize their operations. Assume that hospital maintains suitable data about doctors, patients, nurses, wards and laboratories where various tests are performed. Doctors can be junior or senior doctor. Doctors treat patients prescribe, medicines, tests which are carried out in laboratories. Laboratories print and send report to doctors. Nurses attend to patients in wards. Wards can be private or semi-private or general wards depending on the number of beds. Hospital have contacts with highly specialized hospital where highly complicated cases are referred. Draw the ERD and normalize the database upto 3NF. **[20]**

**Q2)** What is DBMS? Explain the need of DBMS. **[10]**

**Q3)** What is OODBMS? Write advantages of OODBMS Architecture. **[10]**

**Q4)** Consider three transactions T1, T2 and T3 as below and answer the following: **[10]**

Time	T1	T2	T3
1	R(x)		
2			R(y)
3			R(x)
4		R(y)	
5		R(z)	
6			W(y)
7		W(z)	
8	R(z)		
9	W(x)		
10	W(z)		

Draw the precedence Graph of above transaction and check serializability.

**P.T.O.**

**Q5)** a) Assume T1 requests a lock held by T2. The following table summarizes the actions taken for wait-die and wound-wait scheme : **[5]**

	Wait-die scheme	Wound-wait Scheme
T1 is younger than T2	W	X
T1 is older than T2	Y	Z

b) Explain in brief failure classification. **[5]**

**Q6)** Explain Immediate Update Method to recover the data from a log file with example. **[10]**

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

- a) Distributed Database
- b) XML Applications
- c) Advantages of NoSQL



Total No. of Questions : 7]

SEAT No. :

PA-2531

[Total No. of Pages : 2

[5948]-14

M.C.A. (Management Faculty)

IT-14 : ESSENTIALS OF OPERATING SYSTEM

(2019 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Q. 1 & Q. 7 are compulsory.
- 2) Solve any 4 from Q2 to Q6.
- 3) Draw neat diagram whenever necessary.

- Q1)** a) What is operating system? Write any four functionalities of OS. [10]
- b) Consider the following set of processes that arrive at time (0 zero) with the length of CPUQ burst time given in millisec. Calculate average waiting time for Round Robin. [5]

Time slot (ms)	Process	CPU Burst time
4	P <sub>1</sub>	24
4	P <sub>2</sub>	3
4	P <sub>3</sub>	3

- Q2)** Differentiate between paging & segmentation. [10]

- Q3)** Explain any five Linux commands with example. [10]

- Q4)** What is shell? Explain any four shell command. [10]

- Q5)** How many page faults occur for optimal page replacement algorithm for following string with 4 page frames & 3 page frames 7, 0, 1, 2, 0, 3, 0, 4, 2, 3, 0, 3, 2, 1, 2, 0, 1, 7, 0, 1. [10]

P.T.O.



**Q6)** Explain Features of Linux. (any five) **[10]**

**Q7)** Short notes on (Any Three) : **[15]**

- a) Linux file permissions
- b) Dead lock
- c) Runtime issues of Mobile OS
- d) Design issues of distributed operating system.



Total No. of Questions : 8]

SEAT No. :

PA-2532

[Total No. of Pages : 2

**[5948]-15**  
**F.Y.M.C.A. (Management)**  
**(BM11) BUSINESS PROCESS DOMAIN**  
**(2019 Pattern) (Semester-I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q1 and Q8 is compulsory.*
- 2) *Attempt any four from remaining.*
- 3) *Use of calculator is allowed.*

**Q1)** Shiram Agrochemical Pvt. Ltd. is one of the growing agro-chemical manufacturing organizations situated at pune. They want to open its branches all over India. For providing better services to their customers. As a marketing manager you have been asked to -

- a) Suggest market segmentations strategy for this business case. [10]
- b) Suggest any four market mix tactics for this business. [10]

**Q2)** Describe steps involved in buyer decision process with suitable example.[10]

**Q3)** Explain steps involved in Recruitment and selection process. [10]

**Q4)** Discuss Electronic payment system with suitable example and explain risk management options for e-payment systems. [10]

**Q5)** Define inventory. Explain Role of Inventory and discuss in detail Inventory control techniques. [10]

**P.T.O.**

**Q6)** Explain CRM applications in Travel industry and Hotel industry. **[10]**

**Q7)** What is Insurance? Explain types of insurance and explain insurance process in brief. **[10]**

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

- a) Types of Leaves.
- b) Digital payments methods.
- c) Supply Chain Management.
- d) Types of Accounts.
- e) Gratuity and its calculator.



Total No. of Questions : 7

SEAT No. :

PA-2533

[Total No. of Pages : 2

[5948]-21

M.C.A. (Management)

IT21 - DATA STRUCTURES AND ALGORITHM

(2019 Pattern) (Semester-II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

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

Q1) Write an algorithm for insertion sort. Apply insertion sort and show all steps to sort the given 54, 95, 64, 9, 56, 73. [10]

Q2) Define stack, write an algorithm to implement dynamic stack. [10]

OR

Convert the following infix expression into its equivalent postfix form show contents of stack in table format. Represent operator in stack and expression at each step.

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

Q3) Write an algorithm to implement circular queue. [10]

OR

Write an algorithm to implement dequeue. [10]

Q4) Write an algorithm to implement singly linked list, also write algorithm to search a given node from list. [10]

OR

Write an algorithm to display the contents in reverse order of singly linked list. [10]

P.T.O.

Q5) Define B-tree and operations of B - tree.

[10]

OR

Construct AVL tree for the following.

May, Feb, June, Mar, July, Dec, Jan.

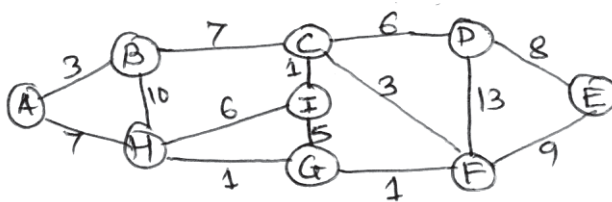
Q6) Explain Breadth first search with suitable example.

[10]

OR

Apply prim's algorithm to obtain minimum cost spanning tree for the following graph.

[10]



Q7) Write short note on (any two)

[10]

- Linear search
- Threaded Binary tree
- Dijkstra's algorithm



Total No. of Questions : 7]

SEAT No. :

PA-2534

[Total No. of Pages : 2

[5948]-22

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

IT - 22 : WEB TECHNOLOGIES

(2019 Pattern) (Semester-II)

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** Design student registration form for MHT - CET having fields like student Registration Id, student Name, Address. City, contact Number, Date of Birth. Validate any five fields with java script. **[10]**

**Q2)** Explain J-Query methods Animte and fade with example. **[10]**

OR

- a) Explain HTML <table> tag with properties. **[5]**
- b) Explain <audio> and <video> tag with example. **[5]**

**Q3)** a) Write CSS code for creating following external style sheet. **[10]**

- i) Body background colour=red
- ii) Font size = 10, colour = brown, name = Trial italic
- iii) Set Margin 30 pixels, padding 30 pixels
- iv) Three types of hyperlinks with mentioned colour-visited - blue, active - red, current - green.
- v) Align H<sub>1</sub> text incenter with right indent - 10px.

OR

- b) Create an external style sheet for ordered and unordered list. **[10]**

**P.T.O.**

**Q4) a)** Explain event Handling in Java Script with example. [10]

OR

b) Explain History and Navigator objects in Java script with example. [10]

**Q5) a)** Explain PHP session with suitable program. [10]

OR

b) Write PHP program to fill online form for patient registration for a Hospital. [10]

**Q6) a)** Explain JQuery setler method with example. [5]

b) Explain looping statements in PHP with example. [5]

**Q7) Short note on (any two)** [10]

- a) JQuery Widgets
- b) Canvas elements
- c) Datatypes in PHP
- d) CSS3



Total No. of Questions : 7]

SEAT No. :

PA-2535

[Total No. of Pages : 2

[5948]-23

F.Y. 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 4 from remaining.*
- 3) *Draw neat diagram wherever necessary.*

**Q1) a)** What is E-mail? Explain different E-mail protocols in detail. **[10]**

b) For the given class C, 192.168.31.1 and subnet mask 255.255.255.224. Calculate **[5]**

- i) Total No. of subnets
- ii) Total No. of host IP. per subnet
- iii) First and last subnetwork address.

OR

b) Define the subnetmask to be used in class B addressing to support 28 subnets and also find the number of hosts possible in each subnet. **[5]**

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

**Q3)** What is Resource Record? Explain different types of RR in detail. **[10]**

**Q4)** What is Security Threat? Explain different security attacks in detail. **[10]**

**P.T.O.**



**Q5)** What is Routing? Explain in detail. Link state routing protocols. **[10]**

**Q6)** An 8-bit/1byte with binary value 10011010 is to be encoded using an even parity. Hamming code what data word is generated after encoding. **[10]**

OR

- a) Suppose the following block of 8 bits to be sent using a checksum of 4 bits: 11001010. Find the checksum of the given bit sequence. **[5]**
- b) The received Hamming code word is 101101010. Using odd parity locates and corrects the bit in error. **[5]**

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

- a) Connection Oriented Vs Connection Less
- b) Switching techniques.
- c) IPv6 packet frame
- d) OSI
- e) P2P



Total No. of Questions : 5]

SEAT No. :

PA-2536

[Total No. of Pages : 4

[5948]-24

**M.C.A. (Management Faculty)**  
**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 and statistical table are allowed.*
- 3) *Figures to the right indicate full marks.*

**Q1) a)** Represent the following information in suitable tabular form with proper ruling and heading. [7]

The Annual Report of a public library reveals the following points regarding the reading habits of it's members. Out of the total 3713 books issued to the members in the month of June 2018, 2100 were fictions. There were 467 members of the library during the period and they were classified into five classes A, B, C, D and E. The number of members belonging to the first four classes were respectively 15, 176, 98 and 129 and the number of fictions issued to them were 103, 1187, 647 and 58 respectively. Number of books other than text books and fictions, issued to these 4 classes of members were 4, 390, 217 and 341 respectively. Textbooks were issued only to members belonging to the classes C, D and E and the number of text books issued to them were respectively 3, 317 and 160.

During the same period 1246 periodicals were issued. These included 396 technical journals of which 36 were issued to members of classes B, 45 to class D and 315 to class E.

To members of the classes B, C, D and E the number of other journals issued were 419, 26, 231 & 99 respectively.

The report however showed an increase by 3.9% in the number of books issued over last month, though there was a corresponding decrease by 6.1% in the number of periodicals and Journals issued to members.

**b)** Explain the procedure of carrying out chi square test for testing independence of two attributes. [7]

OR

**P.T.O.**

- c) In a state, there are 30 Medical colleges, 10 Dental colleges and 50 Engineering colleges. Among the Medical colleges, 5 are government colleges, 10 are aided private colleges and remaining are unaided private colleges of the unaided colleges, 5 are run by minority institutions. Among the Engineering colleges, 10 are government colleges, 20 are aided private colleges and rest are unaided private colleges, of the unaided colleges, 10 colleges are run by minority institutions. Among the Dental colleges, 2 are aided private colleges and the rest are the unaided private colleges of which one is run by a minority institution. Tabulate the above information. [7]
- d) Discuss Sampling and Method of Carrying stratified sampling. [7]

- Q2) a) From the following distribution, calculate the value of mean, median and Q3. [7]

X	300-399	400-499	500-599	600-699	700-799	800-899	900-999	1000-1099	1100-1199
F	18	42	58	75	68	57	48	22	6

- b) Calculate coefficient of variation from the following data. [7]

Age	55-60	50-55	45-50	40-45	40-35	35-30	25-30	20-25
No. of Persons	9	17	20	24	33	28	16	10

OR

- c) The frequency distribution of weight in grams of Mangoes of a given variety is given below. Calculate mode and quartile deviation. [7]

Weight in grams	410-419	420-429	430-439	440-449	450-459	460-469	470-479
No. of Mangoes	15	26	42	56	45	18	7

- d) Calculate the standard deviation from the following data. [7]

Size of item	6	8	9	11	14	18	21
Frequency	3	6	9	13	8	5	4

- Q3) a) A survey amongst women was conducted to study the family life. The observations are as follows. Test whether there is any association between family life and education of women. [7]

Women	Family Life		
	Happy	Not Happy	Total
Educated	75	25	100
Non-Educated	55	45	100
Total	130	70	200

- b) Two types of drugs were used on 5 and 7 patients for reducing their weight : Drug A was imported and drug B indigenous. The decrease in the weight after using the drug for six months was as follows. [7]

Drug A	11	14	13	12	14		
Drug B	9	7	11	13	12	10	9

Is there a significant difference in the efficiency of two drugs? If not, which drug should you buy?

OR

- c) 10 workers are selected at random from a large number of workers in a factory. The number of items produced by them on a certain day are found to be - [7]

52 57 54 59 56 57 58 59 60

In the light of these data, would it be appropriate to suggest that the mean of the number of items produced in the population is 58?

- d) The theory predicts that proportion of beans in four groups A, B, C and D should be in proportion 8:4:3:1. In an experiment among 1600 beans the number in the four groups were 843, 358, 284 and 115. Do the experimental results support the theory? [7]

(Check at 5% level of significance)

- Q4)** a) The following table gives the distribution of marks of English and marks of Mathematics of six students. Check if there is a relation between marks of English and marks of Mathematics. [7]

Marks in English	24	24	33	39	42	30
Marks in Mathematics	27	63	71	80	82	45

- b) From the following data construct a price index number of the group of four commodities by using appropriate formula. [7]

Commodity	Base Year		Current Year	
	Price per unit	Expenditure (Rs.)	Price Per unit	Expenditure (Rs.)
A	8	40	15	75
B	14	56	18	54
C	11	110	21	168
D	16	48	12	60

OR

- c) Compute quantity index numbers for the year 2018 with 2008 as base year, using [7]
- Laspeyre's method
  - Paasche's Method and
  - Also compute Fisher's quantity index numbers.

Commodity	Quantity (units)		Current Year (Price)	
	2008	2018	2008	2018
A	100	75	500	900
B	80	72	320	500
C	60	42	150	360
D	30	33	360	297

- d) From the following data, obtain the two lines of regression. [7]

Sales	95	97	108	121	67	114	51	73	110	57
Purchase	78	79	69	94	70	91	39	61	63	47

- Q5) a) Explain the importance of time series and different components of time series. [7]
- b) Assume three-year cycle. Calculate the trend by method of moving average for the data of tea production in various years. [7]

Year	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Tea prod. in kg.	467	511	519	498	521	543	564	583	579	615

OR

- c) Find correlation coefficient from the following data. [7]
- |   |    |    |    |    |    |    |    |   |   |
|---|----|----|----|----|----|----|----|---|---|
| X | 9  | 8  | 7  | 6  | 5  | 4  | 3  | 2 | 1 |
| Y | 15 | 16 | 14 | 13 | 11 | 12 | 10 | 8 | 9 |
- d) Explain the process of finding trend by using moving average methods. [7]



Total No. of Questions : 6]

SEAT No. :

PA-2537

[Total No. of Pages : 2

[5948] - 25

M.C.A. (Management Faculty)

**BM21 : 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) *Figures to the right indicate full marks.*

**Q1)** Shabarimala of age 38, is co-founder of 7days, a management consultancy business. She earns Rs.20,00,000 a year and lives with her husband Venudharan, 42, who works part-time and their seven-month-old son Partha, in Bengaluru.

Shabarimala was having priorities like family's principal breadwinner; making sure her employees are paid; the constant pressure to win new business; and worrying about whether she spends enough time with her son. She thrives on the pressure of her job and, because she feels largely in control of her life, says that her stress levels are manageable.

'Of course, I feel stressed because running your own business is a 24/7 commitment. It is very difficult to walk away and switch off or to wind down. Days passed and the stress levels kept on increasing.

After a couple of stressful week, one fine morning Shabarimala was not in a mood to get up and prepare herself anymore for the important meeting at her office due to uneasiness and headache and stressed mind . As a result of which the company was at a huge loss ultimately increased her stress levels.

'I know that, if the worst comes to the worst, we could sell the house, downsize and have an easier life'. Her husband said compassionately. But he also knew that was the way of life. **[10]**

If you have to help Shabarimala answer the following questions.

- a) Identify the stressors in the given case and discuss the type of stress.
- b) Suggest suitable stress management strategies.

**P.T.O.**

**Q2)** Define Motivation. Explain any 2 theories of motivation. [10]

**Q3)** “A leadership style is the model of the behavior of an employer which can be observed in the processes of the control over his business and the attitude to his employees”. Explain in detail. [10]

**Q4)** Define Group. Explain the Five-Stage Model of Group Development. [10]

**Q5)** What is a decision? What are different types of decision making environments? [10]

**Q6)** Write short notes on any 4 out of the given. [20]

- a) Types of Managers.
- b) Management Science Approach.
- c) Types of corporate culture.
- d) Social responsibility of management.
- e) Organizational Structure.



Total No. of Questions : 7]

SEAT No. :

PA-2538

[Total No. of Pages : 2

**[5948] - 31**  
**M.C.A.**  
**MANAGEMENT**  
**IT - 31 : Java Programming**  
**(2019 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

**Q1)** Answer in short (any 5) :

**[10]**

- a) What is JVM in Java?
- b) What are inner Classes?
- c) Explain packages in Java
- d) Explain Buffered Reader.
- e) What is Runnable Interface?
- f) Write string functions.

**Q2)** Explain Thread life cycle with suitable diagram.

**[10]**

OR

Explain 2D array with example.

**Q3)** What is linked list in collection framework Explain with example.

**[10]**

OR

Explain final, finally & finalize with suitable example.

**P.T.O.**



**Q4)** Write an applet to move a ball from left to right. **[10]**

OR

Explain Event Delegation model with diagram.

**Q5)** Explain JDBC drivers with neat diagram. **[10]**

OR

Explain servlet life cycle with suitable diagram.

**Q6)** Write a JDBC application for student registration for placement drive. **[10]**

OR

Explain session tracking in servlet with example.

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

- a) RMI.
- b) UDP
- c) Java Bean.
- d) Steps for creating RMI applications.



Total No. of Questions : 8]

SEAT No. :

PA-2539

[Total No. of Pages : 2

[5948] - 32

M.C.A. (Management)

IT - 32 : DATA WAREHOUSING & DATA MINING

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

- 1) Q.1 & Q.8 are compulsory.
- 2) Solve any 5 questions from Q.2 to Q.7.
- 3) Figures to the right indicate full marks.

Q1) What is data preprocessing and explain steps of data preprocessing in detail? [10]

Q2) Explain various steps of data warehouse development life cycle in detail. [10]

Q3) Consider the Market basket transactions shown below. Assuming the minimum support = 50% and Minimum Confidence = 80% [10]

- a) Find all frequent item sets using Apriori algorithm.
- b) Find all association rules using Apriori algorithm.

Transaction Id	Items Bought
T1	{Mango, Apple, Banana, Dates }
T2	{Apples, Dates, Coconut, Banana, Fig }
T3	{Apple, Coconut, Banana, Fig }
T4	{Apple, Banana, Dates }

P.T.O.

**Q4)** Explain Bayesian classification with example. **[10]**

**Q5)** What is Clustering? Explain various methods of Clustering. **[10]**

**Q6)** Explain k-means algorithm with example. **[10]**

**Q7)** What is Classification? Explain Artificial Neural Network with example. **[10]**

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

- a) Difference between OLAP and OLTP.
- b) Web Mining.
- c) Applications of data mining.
- d) Knowledge Discovery Process (KDP).



Total No. of Questions : 7]

SEAT No. :

PA-2540

[Total No. of Pages : 4

[5948] - 33

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

**Q1)** Write a test plan for the following sections of IEEE 829 test plan template for an online book shopping system. **[10]**

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

**Q2)** a) Explain the structure of Mc Call's classic factor model. **[7]**

b) Explain SQA standards. **[3]**

OR

a) What is reliability? What are the factors that affect reliability. **[8]**

b) Define Software quality assurance. **[2]**

**P.T.O.**

- Q3)** a) Explain levels of testing. [8]  
b) Explain usability testing. [2]

OR

- a) Define non-functional testing and explain its types. [8]  
b) Explain security testing. [2]

**Q4)** a) Solve the following :

- i) A system specification states that a particular field should accept alphabetical characters in either upper or lower case. Which of the following test cases is from an INVALID equivalence partition? [3]

- 1) Feeds.
- 2) F33ds.
- 3) FEEDs.
- 4) fEEDs.

- ii) In a bus reservation system the user can reserve seats till its capacity will be full. To test this field, using BVA, what will be the correct set of input values? [3]

- 1) 1, 2, capacity - 1, capacity, capacity + 1
- 2) 0, 1, capacity, capacity + 1
- 3) 0, 1, 2, capacity + 1, a very large number
- 4) 0, 1, 10, 100, capacity, capacity + 1

iii) An address field in software accepts 3 to 25 alpha characters only. Using BVA technique what will be possible number of combinations? [2]

1) 3, 4, 24, 25

2) 2, 3, 25, 26

3) 3, 5, 25, 26

4) 2, 3, 24, 25

b) Define glass box testing [2]

OR

a) Solve the following :

i) Find the minimum tests required for statement and branch coverage for the following [3]

Discount rate = 1;

Fare = 9000;

if (Person == "Senior Citizen") and

(travel - month = "May"))

Bonuspoints = 100 + Bonuspoints

if (Class = "First")

discount Rate = 5;

Fare = Fare \* discount Rate;

ii) An input field takes the year of birth between 1900 and 2004. Find the boundary values for testing this field [3]

1) 0, 1900, 2004, 2005

2) 1900, 2004

3) 1899, 1900, 2004, 2005, 2010

4) 1899, 1900, 1901, 2003, 2004, 2005

iii) A state field in software accepts 5 to 30 alpha characters only. using BVA technique what will be possible number of combinations? [2]

1) 5, 6, 29, 30

2) 4, 5, 30, 31

3) 5, 6, 30, 36

4) 4, 5, 29, 30

b) Define Retesting. [2]

**Q5)** Write 4 test cases for any four fields of admission registration form . [10]

OR

Write any 4 tests cases for traffic signal. [10]

**Q6)** a) Mention the factors to be considered in selecting a testing tool in an organisation. [6]

b) Give reasons for selenium being a widely used testing tool. [4]

OR

a) What is CAST, Describe any 4 types? [6]

b) Enumerate the limitations of selenium testing tool. [4]

**Q7)** Write short notes on : [2 × 5 = 10]

a) Data flow analysis.

b) Beta testing.

OR

a) Types of static testing techniques.

b) ISO 9126 Quality Characteristics.



Total No. of Questions : 8]

SEAT No. :

PA-2541

[Total No. of Pages : 2

[5948] - 34

**M.C.A. (Management Faculty)**

**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) *Solve any five from remaining.*
- 3) *Draw neat and labelled diagrams wherever necessary.*

**Q1)** Define Cloud Computing. Explain Cloud Service Models and types with examples. **[10]**

**Q2)** Explain Virtual Machine types with examples. **[10]**

**Q3)** Explain SaaS and Web Services. **[10]**

**Q4)** What is SoA? Explain benefits of using SoA. **[10]**

**Q5)** Explain difference between Cloud Computing vs. Cluster Computing vs. Grid Computing. **[10]**

**Q6)** What is Cloud Security? Explain the various security issues in cloud. **[10]**

**P.T.O.**



**Q7)** Explain Web (1.0, 2.0 & 3.0) and Web Operating System.

**[10]**

**Q8)** Write short notes (Any Two) :

**[10]**

- a) Virtualization.
- b) PaaS.
- c) Inter Cloud Computing.



Total No. of Questions : 8]

SEAT No. :

PA-2542

[Total No. of Pages : 4

[5948]-35

**M.C.A. (Management)**

**MT 31 : PROBABILITY AND COMBINATORICS**

**(2019 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

*Q1)* Solve any three subquestions out of 5 :

**[3 × 5 = 15]**

- a) In how many ways six men and four women sit in a row? Out of these combinations how many ways they can sit in a row if just all women sit together.
- b) Among 60 students in a class, 45 passed in the first semester examination and 30 passed in second semester examination. If 12 did not pass in either semester, how many passed in both semester.
- c) Two friends A and B apply for two vacancies at the same post. The probability of their selection are  $\frac{1}{4}$  and  $\frac{1}{5}$  respectively. What is the probability that
  - i) Exactly one of them is selected.
  - ii) Atleast one of them is selected.
- d) The diameter of an electric cable say X is assumed to be continuous random variable with probability function given as follows.

$$f(x) = 6x(1 - x) \quad 0 \leq x \leq 1$$

$$= 0 \quad \text{otherwise}$$

- i) Check whether it is a valid probability density function.
- ii) Find expectation of X.

**P.T.O.**

- e) A car hire firm has two cars, which it hires out day by day. The number of demands for a car on each day is distributed as a poisson distribution with mean 1.5. Calculate the probability that on any day
- neither car is used
  - some demand is refused

- Q2)** a) A bag contains 6 white and 9 black balls. Four balls are drawn at a time : Find the probability that first draw will give 4 white balls and second draw will give 4 black balls when the balls are not replaced before the second draw. [5]
- b) The number of solutions of the equations  $x + y + z = 18$  exist subject to the constraint  $x \geq 1, y \geq 2, z \geq 3$ . [5]

- Q3)** a) A factory produces a certain type of outputs by three types of machine. The respective daily production are as follows. Machine I - 3,000 units Machine II - 2,500 units Machine III - 4,500 units. Past experience show that 5% of the output produced by Machine I is defective. The corresponding percentage of defectives for Machine 2 & Machine 3 are 6% and 7% respectively. An item is drawn at random from the day's production run and is found to be defective. What is the probability that it is output of Machine III. [5]
- b) What the different axioms in probability function? Using axiomatic approach prove that if  $B \subset A$  then  $P(B) \leq P(A)$ . [5]

- Q4)** a) Let X and Y be two random variables whose joint probability distribution is given as below [5]

$x \backslash y$	-1	0	1
1	0	0.1	0.2
2	0.2	0.1	0.05
3	0	0.2	0.15

Find :

- $E(X)$
- $E(Y)$
- $E(XY)$

- b) The joint probability density function of a random variable (X, Y) is  
 $f(x, y) = \begin{cases} x(x - y) & 0 < x < 2 - x < y < x \\ 0 & \text{otherwise} \end{cases}$  [5]

Find :

- i) C
- ii) E(X)

- Q5)** a) If a random variable X follow normal distribution with mean 10 and standard deviation 50 calculate [5]

- i)  $P(x \leq + 108)$
- ii)  $P(10 \leq x \leq 108)$
- iii)  $P(x \leq 108/x > 10)$

- b) If X follow uniform continuous distribution with parameter a = 4 b = 10. [5]

Determine

- i)  $P(2 < x \leq 5)$
- ii)  $P(X < 7)$
- iii)  $P(6 \leq X \leq 9)$

- Q6)** a) It is known that screws produced by a certain machine will be defective with probability 0.3. Independent of each other. The screws are sold in packages of 10. Money back guarantee is for atleast 2 defective out of 10. Find the probability of money back. [5]

- b) If  $X \sim N(10, 9)$   $Y \sim N(15, 16)$ . Find the probability of [5]

- i)  $P(X + Y > 32)$
- ii)  $P(X + Y \leq 41)$

**Q7)** a) Two cards are drawn from a well shuffled pack of cards. What is the probability that [5]

- i) Both cards are of same colour
- ii) Both cards are of diff colour.

b) The probability distribution of weekly sales of pendrive in a shop is [5]

Demand	10	11	12	13	14	15
Probability	0.05	0.10	0.25	0.40	0.12	0.08

Find  $E(X)$  and  $V(X)$ .

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

a) How many ways 4 couple sit around a round table if [5]

- i) Husband and wife sit side by side
- ii) No constraint

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

c) Prove the following combinational arguments.

i) 
$$\binom{m+n}{2} - \binom{m}{2} - \binom{n}{2} = m \times n.$$

ii) 
$$\binom{n}{r} = \binom{n-1}{r} + \binom{n-1}{r-1}$$

d) 
$$P(X = x) = \frac{x^2}{30} \quad x = 0, 1, 2, 3, 4.$$

Find :

- i)  $P(x > 2/x \leq 3)$ .
- ii)  $P(0 < x \leq 2)$ .
- iii) Cumulative distribution function of X.

e) Prove Poisson as a limiting condition of binomial distribution. [5]



Total No. of Questions : 7]

SEAT No. :

PA-2543

[Total No. of Pages : 2

**[5948]-41**  
**M.C.A. (Management)**  
**IT 41 : 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) Explain Decorators and Generators in python. **[5]**

b) How to pass value in function explain with suitable example. **[5]**

**Q2)** a) Explain mutable and immutable object in python with suitable example. **[5]**

b) Create new list 'b' which contains only initial letters from given list  
a = ["Pune", "Mumbai", "Delhi", "Nagpur"]. **[5]**

**Q3)** a) Explain operator overloading in python with suitable example. **[5]**

b) What is inheritance? Explain different types of inheritance. **[5]**

**Q4)** a) Write a program to validate password using regular expression. **[5]**

b) How to handle exception in python. **[5]**

**Q5)** What is Pandas? Explain series in pandas in detail. **[10]**

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

b) Explain namespaces in python. **[5]**

**P.T.O.**

**Q7)** Write a short note (any four) :

**[4 × 5 = 20]**

- a) Write(), Write lines().
- b) Creating and searching tables
- c) Static method, static class.
- d) Multithreading
- e) Matplotlib



Total No. of Questions : 7]

SEAT No. :

PA-2544

[Total No. of Pages : 2

[5948]-42

**M.C.A. (Management Faculty)**  
**ESSENTIALS OF ARCHITECTURAL FRAMEWORK**  
**(2019 Pattern) (Semester - IV) (IT-42)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question No. 1 and 7 are compulsory.*
- 2) *Solve any four from remaining.*
- 3) *Draw neat & labelled diagram wherever necessary.*

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

b) What different frameworks are used for developing web applications. [8]

**Q2)** What are the Application Support framework in ITIL framework? [10]

**Q3)** What is Architecture Function and Design Authority. [10]

**Q4)** Explain Six Sigma ( $6\sigma$ ) and Lean. [10]

**Q5)** How Microservices Fit into Devops. [10]

**Q6)** If you want to develop a client application that allows user to print statement in different format and the client application is completely isolated from the details of formatting. Which pattern will you choose for implementation? Explain the pattern. [10]

**P.T.O.**



**Q7)** Write short notes on (any three) :

**[3 × 5 = 15]**

- a) Treasury Enterprise Architecture Framework (TEAF).
- b) Control objectives for Information and Related Technology (COBIT).
- c) Business Process Framework (eTOM).
- d) PMI-the Project Management Body of Knowledge (PMBOK).
- e) ZACHMAN Framework.



Total No. of Questions : 5]

SEAT No. :

PA-2545

[Total No. of Pages : 2

[5948]-43

M.C.A.-II

**IT - 43 : KNOWLEDGE REPRESENTATION &  
ARTIFICAL 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) What are informed search method? Explain any two informed search method. **[10]**

b) What is Knowledge Representation? Explain cycle by Knowledge Representation in AI. **[10]**

**Q2)** Explain the architecture of model based reflex Ag. **[10]**

OR

Explain the role of AI in daily life.

**Q3)** Explain any two inference rule with appropriate example. **[10]**

OR

What are the different operations used in propositional logic.

**Q4)** What are the different components of Expert System. **[10]**

OR

Explain Artificial Neural Network in brief.

**P.T.O.**

**Q5)** Write short notes on (Any Four) :

**[20]**

- a) Partial order planning
- b) Supervised learning
- c) State space search
- d) Bayer's Theorem
- e) Semantics of belief network



Total No. of Questions : 8]

SEAT No. :

PA-2546

[Total No. of Pages : 3

[5948]-44

**M.C.A. (Faculty of Management)**  
**MT - 41 : OPTIMIZATION TECHNIQUES**  
**(2019 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question 1 is compulsory.*
- 2) *Attempt any five from remaining.*
- 3) *Figures to the right side indicate full marks.*

- Q1)** a) A workshop has four machines and four task for completion. Each of the to complete each task is given in the matrix below : **[10]**  
How should the tasks be assigned to machines to minimize requirement of machine hours?

Tasks	Machines			
	A	B	C	D
	Processing Time (Hrs)			
I	51	82	49	62
II	32	39	59	75
III	37	49	70	61
IV	55	60	58	62

- b) A company has three factories with capacities 700, 400 and 600 and four depots with requirements 400, 450, 350 and 500 respectively with the following cost matrix. Solve the problem by Vogel's Approximation Method. **[10]**

Depots	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	D <sub>4</sub>	Capacities
Factories					
f <sub>1</sub>	4	6	8	6	700
f <sub>2</sub>	3	5	2	5	400
f <sub>3</sub>	3	9	6	5	600
Requirement	400	450	350	500	1700

**P.T.O.**

**Q2)** A manufacturing company has a certain piece of equipment that is inspected at the end of each day and classified as just overhauled, good, fair or inoperative. If the item is inoperative it is overhauled, a procedure that takes one day. Let us denote the four classification as states 1, 2, 3 and 4 respectively. Assume that the working condition of the equipment follows a Markov process with the following transition matrix :

If it costs ₹ 125 to overhaul a machine (including lost time) on the average, and ₹ 75 in production is lost if a machine is found inoperative. Using steady state probabilities, compute the expected per day cost of maintenance. [10]

**Q3)** There are five jobs, each of which must go through two machines A & B in the order AB. Processing times are given below : [10]

Job	1	2	3	4	5
Time (in Hrs) for A	5	1	9	3	10
Time (in Hrs) for B	2	6	7	8	4

Determine a sequence for five jobs that will minimize the elapsed time T. Calculate the total idle time for the machines in this period.

**Q4)** A road transport company has one reservation clerk on duty at a time. He handles information of bus schedules and makes reservations. Customers arrive at a rate of 8 per hour and the clerk can service 12 customers on an average per hour. [10]

Find :

- i) Average number of customers waiting for the service.
- ii) Average time a customer has to wait before getting service.
- iii) Average queue length.

**Q5)** A firm is considering replacement of machine, whose cost price is ₹ 12200 and the scrap value ₹ 200. The running (maintenance and operating) cost and found from experience to be as follows : [10]

Year	1	2	3	4	5	6	7	8
Running Cost ₹	200	500	800	1200	1800	2500	3200	4000

When should the machine be replaced?

**Q6)** The following table gives different activities and relevant data : **[10]**

Activity	Immediate Predecessor	Duration (days)		
		Most Likely	Optimistic	Pessimistic
A	-	5	4	6
B	-	12	8	16
C	A	5	4	12
D	B	3	1	05
E	D, A	2	2	2
F	B	5	4	6
G	C, E, F	14	10	18
H	G	20	18	34

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

**Q7)** Explain the following related to game theory. **[10]**

- a) Competitive games.
- b) Two-person-zero-sum game
- c) Strategy
- d) Payoff matrix
- e) Saddle point

**Q8)** A manager must choose between two investments A & B which are calculated to yield net profit of ₹ 1200 and 1600 respectively, with probability subjectively estimated at 0.75 and 0.60. Assume the manager's utility function reveals that utilities for ₹ 1200 and ₹ 1600 amounts are 40 and 45 units respectively, what is the best choice on the basis of expected utility value (EUV)? **[10]**



Total No. of Questions : 6]

SEAT No. :

PA-2547

[Total No. of Pages : 2

[5948]-45

M.C.A. (Management Faculty)

**BM41 : INFORMATION SYSTEM AND SECURITY AUDIT  
(2019 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** It solar power Ltd is a company providing customer and internet banking facilities. Its main customers are some of the biggest banks 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 administrates and have been allocated the duty to assessing the possible security breaches which might occurs. [10]

- a) What are the different types of threats you might identify?
- b) List vulnerabilities you might identify from above case.

**Q2)** a) Explain 3 pillars (CIA) of information security. [5]

b) Write components of ISMS. [5]

**Q3)** KISAN sugar factory decided to computer its their operations using SMS plugging services for communicating with sugarcane farmers. You have been deputed by your software from as information security policy makes for this sugar factory. [10]

- a) Which security policies you will design for this case.
- b) What security standards you will going to propose for this case.

**P.T.O.**

**Q4) What is information security controls? Explain RSA algorithm. [10]**

**Q5) a) Municipal corporation decided to implement online voting system for elections of all wards (booths) coming under municipal areas. You have been deputed as an IT Auditor to identify the possible threats and input control for such system. [10]**

- i) Explain IS audit process for this case.
- ii) Which type of technology based audit you will conduct for this case.

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

**OR**

**a) Celeron Inc. company is implementing ERP system for their day to day operation of developing integrated chips. You have been asked to conduct technology based audit and asked to do following types of testing. [10]**

- i) Write vulnerability scanning process.
- ii) Write steps for penetration testing.

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

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

- a) Responsibilities of IS Auditor.
- b) Securing mobile database.
- c) Penetration testing.
- d) Ethical Hacking.





Total No. of Questions : 8]

SEAT No. :

**PA-2548**

[Total No. of Pages : 1

**[5948]-51**

**M.C.A. - III (Management)**

**IT - 51 : SOCIAL MEDIA & 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 5 from Q2 to Q7.*

**Q1)** Assume that one startup organization wants to promote their business on social media. Suggest suitable plan and tool with benefits for the same. **[10]**

**Q2)** What is digital marketing? Explain Digital Marketing and Ecommerce relationship. **[10]**

**Q3)** How social media marketing is distinct from traditional marketing? Justify?**[10]**

**Q4)** Discuss branding strategies of Social Media. **[10]**

**Q5)** Explain different tools of social media and Digital Marketing. **[10]**

**Q6)** Explain search engine optimization process for achieving high page rank.**[10]**

**Q7)** What is search engine marketing? Explain various tools used for it. **[10]**

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

- a) PPC
- b) Off page optimization
- c) SEO Tools



Total No. of Questions : 7]

SEAT No. :

**PA-2549**

[Total No. of Pages : 1

**[5948]-52**

**M.C.A. - III**

**IT - 52 : MOBILE APPLICATION DEVELOPMENT**

**(2019 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q.1 & Q.7 are compulsory.*
- 2) *Solve any four questions from 2 to 6.*
- 3) *Figures to the right indicates marks.*

**Q1)** Explain Windows Architecture in detail. **[10]**

**Q2)** Define fragment. Explain fragment life cycle in detail. **[10]**

**Q3)** Write an application to accept login details from the user on successful login show welcome message to user on new activity. **[10]**

**Q4)** Write an android application using sqlite to create student table (s-id, s-name, s-course). Write a code to insert and display the records. **[10]**

**Q5)** Demonstrate web view to display the web page in android app. **[10]**

**Q6)** Write an application to display a pdf as an image in react app using Url. **[10]**

**Q7)** Write short note on following (Any four). **[20]**

- a) Overview of flutter
- b) Android Toast
- c) View groups
- d) Fragment
- e) Dart programming



Total No. of Questions : 6]

SEAT No. :

**PA-2550**

[Total No. of Pages : 2

**[5948]-53**

**M.C.A. - III (Management)**

**IT - 53 : SOFTWARE PROJECT MANAGEMENT**

**(2019 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** Attempt the following questions (any four). **[4×5]**

- a) List characteristics of software project.
- b) What is rapid application development.
- c) List advantages of function point analysis.
- d) What is scrum in Agile?
- e) What is difference between Agile and waterfall.
- f) What is test driven development?

**Q2)** a) List Agile manifesto principles. **[5]**

b) Explain importance of risk management in project management. **[5]**

OR

a) What are steps in risk mgt. process? Explain in brief. **[5]**

b) What is mean by software project? How it differs from other project. **[5]**

**Q3)** a) Explain in brief cocomo model. **[5]**

b) Write short note on - Features of MS-Project. **[5]**

OR

a) Explain Advantages of SEI CMM model. **[5]**

b) What are components of function point analysis. **[5]**

**P.T.O.**

**Q4)** a) Explain how Agile project management different from traditional project management. [5]

b) List steps in defect mgt. process. [5]

OR

a) Explain product backlog in brief. [5]

b) How to calculate velocity in Agile. [5]

**Q5)** a) Explain Jira - Agile tool in brief. [5]

b) What is sprint in Agile? [5]

OR

a) Explain role of product owner. [5]

b) Explain in brief product Roadmap. [5]

**Q6)** a) What is product Backlog in scrum. [5]

b) What are advantages of Agile project Management. [5]

OR

a) What are desirable qualities of product vision? [5]

b) Explain any two Agile reports in brief. [5]



Total No. of Questions : 4]

SEAT No. :

PA-4507

[Total No. of Pages : 3

[5948]-71

**M.C.A. (Management Faculty)**  
**MT-21 : DISCRETE MATHEMATICS**  
**(2015 Pattern) (Semester - II) (225)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question No. 1 is compulsory.*
- 2) *Attempt any two questions from Q. No. 2, 3 and 4.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of scientific calculator is allowed.*

**Q1)** a) Let  $f(x)$  and  $g(x)$  be two real valued functions defined as  $f(x) = \frac{x^2 - 4}{3}$

and  $g(x) = 2x + 5$  find fof, gof and fog., fofog. [5]

b) Show the following equivalence  $(\neg(P \rightarrow \neg Q) \rightarrow R) \Leftrightarrow (P \rightarrow (Q \rightarrow R))$ . [5]

c) Let  $G = \{1, a, a^2, a^3\}$  where  $a^4 = 1$ , be a group and  $H = \{1, a^2\}$  be the subgroup of  $G$  under multiplication. Find all the left cosets of  $H$ . [5]

d) Find the inverse, converse and contrapositive of the implication. If today is a holiday then I will go for a movie. [5]

e) Define with illustrations : [5]

i) Complete bipartite graph.

ii) Euler's circuit.

f) Let  $A = \{1, 2, 3, 4\}$  and  $R$  be the relation defined on  $A$  where  $R$  is given as  $R = \{(x, y) / x + y > 4\}$ . Write the relation  $R$ , its matrix and draw digraph. [5]

**Q2)** a) Rewrite the following statements in symbolic notations : [5]

i) If it is not raining then I will go out to play.

ii) It is raining and I did not go out to play.

iii) I will go out to play if and only if it is not raining.

**P.T.O.**

- b) Show that  $R \vee S$  follows logically from the premises without using truth table.  $(C \vee D), (C \vee D) \rightarrow \neg H, (A \wedge \neg B), \neg H \rightarrow (A \wedge \neg B) \rightarrow (R \vee S)$ . [5]
- c) Obtain PCNF for the following :  $(\neg P \rightarrow R) \wedge (Q \leftrightarrow P)$ . [5]
- d) Express the following statements using quantifier : [5]
- If the teacher is absent, then some students do not keep quiet.
  - All the students keep quiet and teacher is absent.
  - Some of the students do not keep quiet or the teacher is absent.

**Q3)** a) Let  $f: R \rightarrow R$  be given by : [5]

i)  $f(x) = x^2 - 3$

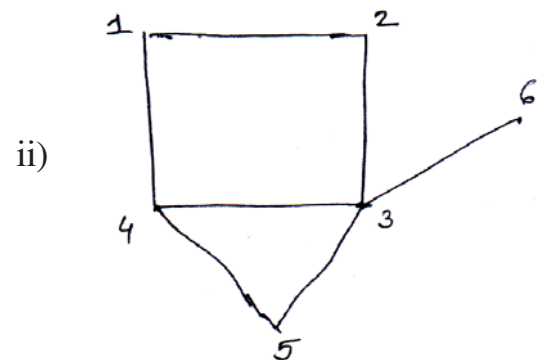
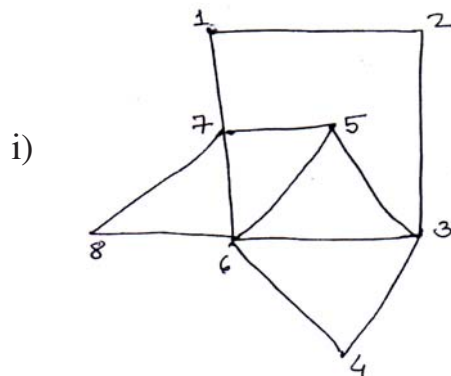
ii)  $f(x) = 3x + 5$

iii)  $f(x) = 2x^3 + 4$

Find  $f^{-1}$  of the functions

- b) Let  $A = \{1, 2, 3, 4\}$  and  $R$  be the relation defined on  $A$  as  $R = \{(1, 2), (1, 3), (2, 1), (2, 2), (3, 3), (4, 1), (4, 3)\}$  use Warshall's algorithm to find transitive closure of  $R$ . [5]
- c) Show that  $(Z, *)$  is a group, where  $*$  is defined by  $a * b = a + b + 1$ . [5]
- d) Show that the group  $G = \{1, -1, i, -i\}$  is a cyclic group and find its generator. [5]

**Q4)** a) For the planar graphs calculate the number of regions formed using Euler's formula. [5]

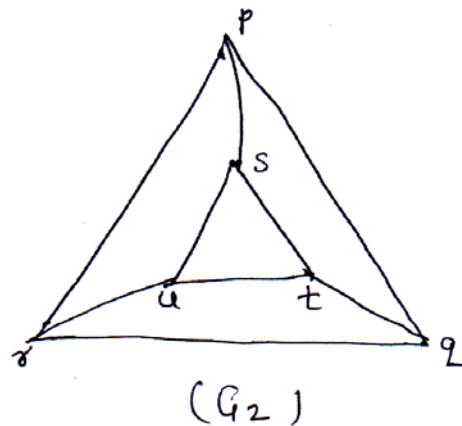
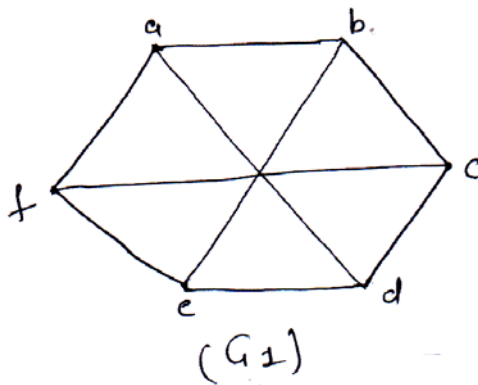


- b) Draw two complete ternary trees with : [5]
- i) 10 vertices
  - ii) 13 vertices

- c) Find the code words generated by the parity check matrix H where

$$H = \begin{bmatrix} 1 & 0 & 1 & 0 & 1 & 0 & 0 \\ 1 & 1 & 0 & 1 & 0 & 1 & 0 \\ 1 & 0 & 0 & 1 & 0 & 0 & 1 \end{bmatrix}. \quad [5]$$

- d) Check whether the following two graphs are isomorphic. [5]



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Total No. of Questions : 7]

SEAT No. :

PA-4508

[Total No. of Pages : 2

[5948]-72

**M.C.A. (Management)**

**T1-IT33 : OBJECT ORIENTED ANALYSIS & DESIGN**

**(2015 Pattern) (Semester - III) (326A)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q.1 & Q.7 are compulsory.*
- 2) *Solve any four from the remaining.*
- 3) *Mention assumptions made for solving the case studies.*

**Q1)** For a construction company a software has to developed with following specifications :

The company takes up many projects at different locations. Each of these projects are supervised by project managers assigned by the company. Records related to the start and completion of the project is to be maintained. Under the project manager there is a team of people of categories like designer, architect, plumber, electrician, labour etc. Each project is marketed by a team of marketing executives. Draw the following diagrams for the above case.

- a) Use case diagram. [10]
- b) Class diagram. [10]

**Q2)** Explain RUP process in detail. [10]

- Q3)**
- a) Draw a sequence diagram for ordering an item from an e-shoppe. [5]
  - b) Draw an activity diagram for online booking in a hotel. Write your own assumptions. [5]

- Q4)**
- a) Explain Test strategies. [5]
  - b) Draw State Transition Diagram for money withdrawal from an ATM. [5]

**P.T.O.**



**Q5)** Explain various approaches for identifying classes. **[10]**

**Q6)** Explain inheritance and its types. **[10]**

**Q7)** Attempt (any two) : **[2 × 5 = 10]**

a) Reverse Engineering

b) Polymorphism

c) Patterns



Total No. of Questions : 7]

SEAT No. :

PA-4509

[Total No. of Pages : 2

[5948]-73

**M.C.A. (Management Faculty)**

**T1-IT-51 : ASP .NET USING C#**

**(2015 Pattern) (Semester - V) (524A)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q.1 & Q.7 are compulsory.*
- 2) *Solve any four from the remaining.*
- 3) *Figures of right indicates full marks.*

**Q1)** Explain data adapter, data set, data reader, connection and command objects in detail. **[15]**

**Q2)** Design ASP .NET form and write code for student Admission system to perform following tasks : **[10]**

- a) Add record of student in the database.
  - b) Display all records of students in grid view control from database.
- Assume regd. tables with suitable fields and data types.

**Q3)** Explain Ajax controls in detail with example. **[10]**

**Q4)** Explain ASP .NET page life cycle in detail. **[10]**

**Q5)** Explain connected architecture of ADO .NET in detail. **[10]**

**Q6)** a) Write a program to implement hit counter using global. a sax file. **[5]**

b) Exception Handling. **[5]**

**P.T.O.**

**Q7)** Write short notes on (any three) :

**[3 × 5 = 15]**

- a) Post Back
- b) Authentication and Authorization
- c) IIS
- d) MVC



Total No. of Questions : 8]

SEAT No. :

PA-4519

[Total No. of Pages : 2

[5948]-74

**M.C.A. (Management Faculty)**

**T1 - IT - 52 : SERVICE ORIENTED ARCHITECTURE**

**(2015 Pattern) (Semester - V) (525 A)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) *Q. No. 1 and Q.No. 8 are compulsory.*
- 2) *Solve any five questions from Q.2 to Q.7.*
- 3) *Each question carries 10 marks.*

*Q1)* Explain common principle of service orientation. **[10]**

*Q2)* Explain SoA and explain pitfalls of adopting SoA. **[10]**

*Q3)* Explain WS-Addressing and WS-Reliable Messaging. **[10]**

*Q4)* Explain the concept of Choreography and Orchestration in SoA. **[10]**

*Q5)* Explain SoA delivery lifecycle along with top-down strategy. **[10]**

*Q6)* Explain SOAP language basics and its elements. **[10]**

**P.T.O.**

**Q7)** Describe business centric SoA with suitable case.

**[10]**

**Q8)** Write Short Notes (**Any Two**) :

**[10]**

- a) Web Service.
- b) Messaging with SOAP.
- c) SoA standards.



Total No. of Questions : 7]

SEAT No. :

PA-4512

[Total No. of Pages : 2

[5948]-75

**M.C.A. (Management Faculty)**

**T3-BM52 : ENTREPRENEURSHIP DEVELOPMENT**

**(2015 Pattern) (Semester - V) (525C)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) Question No. 1 and 7 are compulsory.*
- 2) Solve any four questions from remaining questions.*
- 3) Figures of right indicates full marks.*
- 4) Draw neat diagrams and quotes examples wherever necessary.*

**Q1)** Air Travel has become a regular mode of commute, especially for the people who work in the company which has multiple presence or having customers at various locations. As per the norms, the passenger needs to check-in 02 hours in advance, which is very critical due to busy schedule. As an aspiring entrepreneur, identify an opportunity for a start up in the above-mentioned scenario. Prepare a detailed Project Report for your business plan. **[10]**

**Q2)** Mention any four triggering factors for a person to become an entrepreneur. **[10]**

**Q3)** Write any five barriers of entrepreneurship? **[10]**

**Q4)** Discuss The Need And Objectives of Entrepreneurial Development Programmes (EDP). **[10]**

**Q5)** Define MSMEs? Briefly explain about the Significance of MSMEs in India? **[10]**

**Q6)** Describe the institutional support and policies that cause entrepreneurial growth in a country. **[10]**

**P.T.O.**

**Q7)** Write short notes on (any four) :

**[4 × 5 = 20]**

- a) Entrepreneurial mobility
- b) Functions of Management
- c) Development of SSI Sector
- d) Institutional finance for small enterprises
- e) Marketing Mix



Total No. of Questions : 7]

SEAT No. :

PA-4513

[Total No. of Pages : 1

[5948]-76

**M.C.A. (Management Faculty)**

**T1-IT53 : BIG DATA ANALYTICS**

**(2015 Pattern) (Semester - V) (526A)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question No. 7 is compulsory.*
- 2) *Answer any five questions from Q1 to Q6.*
- 3) *Figures to the right indicate full marks.*

**Q1)** What is Big Data? Explain Big Data Analytics for Health care. **[10]**

**Q2)** What is Enterprise Information Management? Explain in detail. **[10]**

**Q3)** What are the Big Data warehouse system requirements and explain Hybrid Architecture. **[10]**

**Q4)** What is NOSQL database? Provide comparative Analysis of any two NOSQL databases. **[10]**

**Q5)** Explain Big Data work load Design Approaches. **[10]**

**Q6)** Explain Big Data Analytics methodologies in detail. **[10]**

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

- a) Hadoop frame work
- b) Map Reduce
- c) Data Modeling for Big Data
- d) HDFS
- e) In-memory Database Grids





Total No. of Questions : 8]

SEAT No. :

PA-4514

[Total No. of Pages : 1

[5948]-77

**M.C.A. (Management Faculty)**

**T3-IT53 : DECISION SUPPORT SYSTEM**

**(2015 Pattern) (Semester - V) (526C)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question No. 1 and 8 are compulsory.*
- 2) *Answer any five questions from remaining.*
- 3) *Figures to right indicates full marks.*

**Q1)** Define ESS. Explain characteristics and capabilities of ESS. **[10]**

**Q2)** Explain prototyping as a DSS development methodology. **[10]**

**Q3)** Explain knowledge based expert system in detail. **[10]**

**Q4)** What is enterprise DSS? Explain evolution of executive and enterprise information system. **[10]**

**Q5)** Explain data collection problems and its quality. **[10]**

**Q6)** Explain how an intelligent DSS can be implemented? **[10]**

**Q7)** Explain DSS technology tools and levels. **[10]**

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

- a) OLAP
- b) Artificial Intelligence
- c) Organizational DSS



Total No. of Questions : 7]

SEAT No. :

PA-4520

[Total No. of Pages : 2

[5948]-78

**M.C.A. (Management Faculty)**

**T3 - IT - 54 : BUSINESS ARCHITECTURE**

**(2015 Pattern) (Semester - V) (527 C)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) *Question No. 7 is compulsory.*
- 2) *Answer any five questions from Q.1 to Q.6.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*

**Q1)** Explain Business system model including process structures. **[10]**

**Q2)** Explain master data management and implementation. **[10]**

**Q3)** Explain standards and regularity requirements in business architecture. **[10]**

**Q4)** Explain firewalls and De-Militarised Zone (DMZ). **[10]**

**Q5)** Explain Integrated Information Infrastructure Reference Model (III-RM). **[10]**

**Q6)** Explain Software Development Life Cycle (SDLC). **[10]**

**P.T.O.**

**Q7)** Write short notes on (Any 4) :

**[20]**

- a) Model-Driven Architecture (MDA).
- b) Scope of the Architecture work.
- c) Design for data security.
- d) Server Consolidation.
- e) Model-View Controller (MVC).
- f) Application Programming Interface (API).

