

Total No. of Questions : 7]

SEAT No. :

**P6960**

[Total No. of Pages : 3

**[5865]-11**

**MCA (Management)**

**IT 11: PROBLEM SOLVING USING C++**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) *All questions carry 10 marks each.*
- 2) *All questions are compulsory.*

**Q1)** a) Write algorithm for find x raise to y. where values of x and y taken from user. **[5]**

b) Explain divide and conquer algorithmic Paradigms. **[5]**

**Q2)** a) Explain inline function using example. **[5]**

b) Write a program to read string from the user and count vowels and consonants using function. **[5]**

OR

c) Write a program to read two numbers and swap two numbers using function with reference variables. **[5]**

d) Explain function overloading using example **[5]**

**Q3)** a) Define class complex number with data member(real, img) and overload + operator to add two complex numbers, overload cout operator to display complex number. **[7]**

b) Explain this pointer. **[3]**

*P.T.O.*

OR

- c) Define class point with data member(x,y,z) and overload > operator to compare two points, overload cout operator to display points object. [7]
- d) Explain Static member function. [3]

- Q4)**
- a) Define class person with required data members and member function from this person class derive teacher class with additional data members and member functions. [7]
  - b) Features of Object oriented Programming. [3]

OR

- c) Explain Multiple inheritance using example. [7]
- d) Create structure "Address" and initialize it. [3]

- Q5)**
- a) Write a program to read n numbers from user and store it by allocating memory and search x value in entered numbers and print proper message. Read n and x from user. [7]
  - b) Explain Enumerated. Create for Colors and used it. [3]

OR

- c) What is manipulators, explain any four manipulators [7]
- d) Explain Escape sequences [3]

- Q6)**
- a) Define class rational number with data member(numerator, denominator) with default parameterized constructors and member function to display values. [8]
  - b) What is Typecasting? [2]

OR

- c) Explain constructor overloading with example. [8]
- d) Explain new operator with syntax [2]

**Q7)** a) Write a program to implement tower of Hanoi and explain which problem solving approach is used for tower of Hanoi. [8]

b) What is ternary operator and Syntax of ternary operator? [2]

OR

c) Write a program to implement Tic Tac Too. [8]

d) Explain continue statement [2]



Total No. of Questions : 7]

SEAT No. :

**P8370**

**[5865] - 12**

[Total No. of Pages :1

**M.C.A.**

**IT-12 : SOFTWARE ENGINEERING USING UML  
(2019 Pattern) (Semester - I)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q1 & Q7 are compulsory.*
- 2) *Solve any four from remaining.*
- 3) *Draw neat and labeled diagram whenever necessary.*

- Q1)** My shop International accept customer order from website www. myshop.com for various goods. The invoice is generated and email to the customer. The goods are delivered to the customer through 3 logistic agent located at customer's city. The logistic agents received a copy of invoice by email. The logistic agent collects the payment of invoice while delivering goods & sends it to my shop International. Customer can reject entire delivery or a part of it. Such rejection is communicated by logistics agents to company. Company may charge customer for such rejection. Prepare the SRS in IEEE format.[20]
- Q2)** Draw sequence diagram for drawing money from ATM M/C. [10]
- Q3)** Design the layout of a final bill given to patient by "Ashirwad Hospital at discharge. [10]
- Q4)** Explain how both waterfall and prototyping model can be accommodated in the spiral process model. [10]
- Q5)** Draw activity diagram for arranging the college orchestra in your annual gathering. [10]
- Q6)** Prepare a class diagram for "Medical Shop Management" consisting of at least three classes. [10]
- Q7)** Write notes on: (Any Two) [10]
- a) Web Engineering
  - b) Phases of SDLC
  - c) Agile process
  - d) State transition diagram.



Total No. of Questions : 7]

SEAT No. :

**P6961**

[Total No. of Pages : 2

**[5865]-13**

**F.Y. MCA (Management)**

**IT 13: DATABASE MANAGEMENT SYSTEM**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instruction to the candidates :*

- 1) Q1 is compulsory.*
- 2) Solve any five from Q2 to Q7.*
- 3) Figures to the right indicate full marks.*

*Q1)* A publishing company produces scientific books on various subjects. The books are written by authors who specialize in one particular subject. The company employs editors who, not necessarily being specialists in a particular area, each take sole responsibility for editing one or more publications. A publication covers essentially one of the Specialist subjects and its normally written by a single author. When writing a particular book, each author works with an editor, but may submit another work for publication to be supervised by other editors. To improve their competitiveness, the company tries to employ a variety of authors, more than one author being a specialist in a particular subject.

Draw the ER Diagram and Normalize upto 3NF.

**[20]**

*Q2)* Explain various characteristics of DBMS.

**[10]**

*Q3)* What is XML? Explain structure of XML.

**[10]**

*P.T.O.*

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

$T_1$	$T_2$	$T_3$
Read (A)	Read (C)	Read (B)
$A = A + 100$	Read (B)	$B = B + 200$
Write (A)	$B = B + C$	Write (B)
Read (B)	Write (B)	Read (C)
$B = B + 100$	Read (A)	$C = C + 200$
Write (B)	$A = A - C$	Write (C)
	Write (A)	

**Q5)** a) Consider the following transactions. Give two non-serial schedules that are serializable. **[5]**

$T_1$	$T_2$
Read (A)	Read (A)
$A = A + 1000$	$A = A - 1000$
Write (A)	Write (A)
Read (C)	Read (B)
$C = C - 1000$	$B = B - 1000$
Write (C)	Write (B)
Read (B)	
$B = B + 1000$	
Write (B)	

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

**Q6)** Explain the deferred update techniques of recovery with example. **[10]**

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

- a) Mobile Database.
- b) ODL
- c) NoSQL.



Total No. of Questions : 7]

SEAT No. :

**P6962**

[Total No. of Pages : 2

**[5865]-14**

**MCA (Management)**

**IT 14: ESSENTIALS OF OPERATING SYSTEM**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

**Q1)** a) What is Operating system? Write features/functionalities/services of Operating system. **[10]**

b) Draw Gantt Chart. Calculate average waiting time for FCFS and SJF scheduling. **[5]**

Process	Burst Time	Arrival Time
P1	6	0
P2	8	0
P3	7	0
P4	3	0

**Q2)** What is Paging? Explain Page Table. **[10]**

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

*P.T.O.*

**Q4)** What is shell? Explain any four shell commands. **[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]**

**Q6)** Explain features of Linux. **[10]**

**Q7)** Short Notes (Any 3) : **[15]**

- a) ARM.
- b) Design Issues in Distributed OS.
- c) PCB.
- d) Linux File permission.





Total No. of Questions : 8]

SEAT No. :

**P8046**

[Total No. of Pages : 2

**[5865]-15**

**F.Y. MCA (Management)**

**BM-11 : BUSINESS PROCESS DOMAIN**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q.1 and Q.8 are compulsory.*
- 2) *Solve any four from the remaining.*
- 3) *Use of calculator is allowed.*

**Q1)** On the global personal computer map, Acer emerged from obscurity to become the third largest PC company only behind Dell and HP. But the company wasn't a smash hit over night. Staying true to its South Asian culture, the company worked up the Ladder, rather silently, and building brick-by-brick. On its way up, the company worked out many handles - ranging from branding problem to facing near boycott from the then stalwarts in the business - and gradually overtook much bigger and older companies. The long standing chairman Stan Shin putup a workman - like effort solving one problem after the other and steering the company in one of the most competitive industry. All the way through, he stuck to the basics of the business, focus on quality, quantity and low cost. Acer's Asian counterpart, Lenova, made its mark in the global PC market with a bary by taking over IBM's PC business. From then on, the rivalry between the two Asian giants caught the attention of industry as well as academia. The industry is tracking them for remaking the global PC industry dynamics by challenging the western companies that have practically invented and built the industry over decades. The academia is observing the theoretical and strategical underpinnings and are scripting the journey of these two global giants from the developing World.

- a) You have been asked to suggest market segmentations strategy for this business case. **[10]**
- b) Suggest any four market mix tactics for this business. **[10]**

**Q2)** a) Calculate gratuity of employee who is working for infosys for 5.7 years and getting basic salary is Rs. 19,000/- month and DA is 20%. **[3]**

**P.T.O.**

- b) Calculate gratuity of employee who is working for TCS for 4.4 years and getting basic salary Rs. 17000/- month and DA is 12000/- month.[3]
- c) Calculate gross salary of the employee for the month of January, 2019 and cumulative gross salary of month of November, 2019 working on pay roll of Basic - 20,000/-, DA - 60%, HRA - 40% and Allowance - 22%. [4]

**Q3)** What is e-commerce? Explain any three business models of e-commerce. [10]

**Q4)** What is supply chain? Explain needs and drivers of supply chain. [10]

**Q5)** What is CRM? Explain need of CRM in business. [10]

**Q6)** Develop CRM implementation strategy for Hotel Industry. [10]

**Q7)** Explain Digital payments - NEFT, RTGS, IMPS, BHIM, UPI [10]

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

- a) Leave types
- b) Loan types
- c) Insurance types
- d) Vender Managed Inventory (VMI)
- e) TMS



Total No. of Questions : 7]

SEAT No. :

**P6963**

[Total No. of Pages : 2

**[5865]-21**

**MCA (Management)**

**IT 21: 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 merge sort. Apply merge sort and show all steps to sort the following. **[10]**  
69, 32, 49, 96, 43, 54, 99.

**Q2)** Define stack, explain representation of stack using array and linked list. **[10]**

OR

Evaluate the following prefix expression **[10]**  
 $- + AB - * C + DE$  where  $A = 16, B = 4, C = 3, D = 6, E = 7$   
Show contents of stack at each step in tabular form.

**Q3)** Write an algorithm to implement input and output restricted DEQUEUE. **[10]**

OR

Write an algorithm to implement static priority queue. **[10]**

**Q4)** Define linked list, write an algorithm to implement doubly linked list. **[10]**

OR

*P.T.O.*

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

Q5) Define BST, explain traversal of binary tree with example. [10]

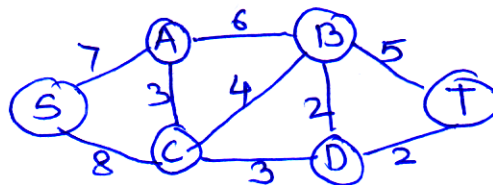
OR

Construct AVL tree for the following 68, 82, 70, 49, 38, 75, 9, 82. [10]

Q6) Explain Depth First search with suitable example. [10]

OR

Apply Prim's algorithm to obtain minimum cost spanning tree for following graph. [10]



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

- Binary Search.
- Threaded Binary tree.
- Adjacency Matrix, Adjacency list.

\* \* \*

Total No. of Questions : 7]

SEAT No. :

P6964

[Total No. of Pages : 2

[5865]-22

F.Y MCA (Management)

IT 22: WEB TECHNOLOGIES

(2019 Pattern) (Semester - II)

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

**Q1)** Write a Javascript program to validate fields of DTE registration form. **[10]**

- Name should contain only characters (alphabets)
- Mobile phone contain only digits (10)
- Email should contain '@', '.' after '@' symbol and 2/3 alphabets after '.' at last.
- Gender should contain only 2 values male/female
- Password & confirm password should match.

**Q2)** Explain Filters in JQuery with example (atleast 5) **[10]**

OR

- a) Explain <canvas>tag with example. **[5]**
- b) Explain <audio> & <video>tags with example. **[5]**

**Q3)** Write a CSS script for following : **[10]**

- Body with text color Blue & background as cyan
- Paragraph with color Green & alignment justify
- Document margin top & left to 1 inch.
- Border with red color and dotted
- Image with 50% opacity & vertical space 10 pts.

*P.T.O.*

OR

Write a CSS script for following : [10]

- Body with background image at center & no repeat
- Hyperlink without underline & visited link color yellow
- Paragraph with letter spacing 0.2 & line height double
- Active link color green and link color red
- Image with horizontal spacing 10pts. & height width 200 pts.

**Q4)** Design HTML form to do driving license registration. Take suitable fields. Using javascript do validations (Name, Age, Email, Mobile, Gender) [10]

OR

Write Javascript program to generate bill of any 5 products purchased by customer. [10]

**Q5)** Write a PHP program to perform CRVD operations on patient details. [10]

OR

Write a PHP program to maintain the shopping CART of each customer.[10]

**Q6)** a) What is chaining in JQuery? How does chaining used in web pages. [5]

b) Explain cookies in PHP with example. [5]

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

a) Write JQuery Getter & Setter methods with example.

b) Explain <table> tag with example.

c) Explain error handling in PHP with example.

d) Explain Transformation & Transitions in CSS3 with example.



Total No. of Questions : 7]

SEAT No. :

**P6965**

[Total No. of Pages : 2

**[5865]-23**

**MCA (Management)**

**IT 23: ESSENTIALS OF NETWORKING**

**(2019 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

- 1) *Q1 and Q7 are compulsory.*
- 2) *Solve any four questions from Q2 to Q6.*

**Q1) a) What is FTP? Explain FTP process and transactions in detail. [10]**

**b) For the given class 'C' 192.168.53.1 and subnet mask - 255.255.255.192. Calculate [5]**

- i) Total number of subnets
- ii) Total number of host IPs/subnet
- iii) First and Last subnet work address.

**OR**

Define the Subnetmask to be used in class B addressing to support 27 Subnets and also find the number of hosts possible in each Subnet.

**Q2) Compare OSI Vs TCP/IP models in detail. [10]**

**Q3) What is DNS? Explain DNS Query message and Response message in detail. [10]**

**Q4) What is Firewall? Explain different types of Firewalls. [10]**

*P.T.O.*

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

**Q6)** Generate CRC code for the data word 1010001011 using the divisor 11101.**[10]**

OR

The received CRC code by the receiver is 10100010101000, find out whether it is received with or without error by using the divisor 11101. **[10]**

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

- a) Ethernet.
- b) Communication device - Router.
- c) CIDR.
- d) Special IP addresses.
- e) Frame types.

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Total No. of Questions : 5]

SEAT No. :

P6966

[Total No. of Pages : 5

[5865]-24

**First Year M.C.A. (Management)**  
**MT 21: BUSINESS STATISTICS**  
**(2019 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

- Q1)** a) Out of total number of 2807 women who were interviewed for employment for textile factory 912 were from textile areas and rest from non-textile areas. Amongst the married women who belong to textile area, 347 were having some work experience and 173 did not have work experience. While from non-textile area the corresponding figures were 199 and 670 respectively. The total number of women having no experience was 1841 of whom 311 resided in textile area. Out of total number of women 1418 were unmarried and of these the number of women having experience in the textile and non textile areas were 254 and 166 respectively. Tabulate the following information. [7]
- b) What is Sampling? Define the need of Sampling? Define the basic statistical laws to reduce Sampling error. [7]

OR

- c) Define the following terms with illustration. [7]
- i) Level of significance
  - ii) Type II error
  - iii) Statistic and parameter
- d) Write detail note on correlation? Explain the method of finding correlation graphically. [7]

*P.T.O.*

- Q2)** a) Find appropriate measure of Central tendency for the marks obtained by the students. [7]

(More than) Marks	No. of Students
0	157
15	144
30	121
45	89
60	68
75	43
90	20
105	0

- b) When do we use dispersion? Write a note on absolute and relative measure of dispersion. [7]

OR

- c) A test was conducted for two groups of students. The score of two groups of students are as below. Find the combined mean and combined Standard deviation of marks. [7]

Group I :	24	13	18	25	36	47	54	37
Group II :	33	19	22	32	48	41	30	

- d) Define coefficient of Variation. Among the two series of observations, identify which series is more consistent. [7]

Class	10-20	20-30	30-40	40-50	50-60	60-70	70-80
Series A	3	7	12	9	7	5	3
Series B	4	6	11	10	6	3	2

- Q3)** a) The research scholar was interested in the relationship between placement of students in the Statistics department of a reputed university and their CGPA is as follows : [7]

Observed frequency of placed students	CGPA				
	10-9	9-8	8-7	7-6	Below 6
	27	36	18	11	8

Check whether placed students are in the proportion 2:3:2:1:1 for different CGPA categories.

- b) The sales data of an item in six shops before and after a special promotional campaign are as under. [7]

Shops	A	B	C	D	E	F
Sale before campaign	54	25	34	47	51	42
Sale after campaign	59	29	31	58	59	46

Can the campaign be judged as a success at 5% level.

OR

- c) A public opinion poll surveyed a simple random sample of 1200 voters. Respondents were classified by gender (male or female) and by voting preference (Republican, Democrat or Independent). Results are shown in the following table. [7]

Sex	Voting Preferences		
	Rep.	Dem.	Ind.
Male	295	206	85
Female	305	244	65

Do the men's voting preferences differ significantly from the women's preference (5% level of significance)

- d) Researchers are interested in the mean age of a certain population. For this a random sample of 13 individuals are drawn from the population of interest which has a mean of 27. Assuming that the population is approximately normally distributed with variance 18. Can we conclude that the mean is different from 29 years? ( $\alpha = 0.05$ ) [7]

- Q4)** a) From the following data estimate demand when price is Rs. 43, using suitable regression equation. [7]

Price (in Rs.)	27	33	26	41	39	31	38
Demand	19	28	17	26	19	22	23

- b) Define cost of living index. Find cost of living index for the data given below. [7]

Commodity	Price in 2009	Price in 2019	% of usage
A	62	70	15
B	43	54	17
C	109	125	30
D	44	58	25
E	18	26	13

OR

- c) Find  $R_{1,23}$ ,  $R_{3,12}$ ,  $r_{12,3}$ ,  $r_{23,1}$  for  $r_{12} = 0.6$ ,  $r_{13} = 0.65$ ,  $r_{23} = 0.7$ . [7]

- d) Find Laspeyres's and Paasche's Price Index [7]

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

- Q5) a) Write a detail note on Time series. [7]

- b) The annual production of a commodity is given as follows.

Year	2000	2001	2002	2003	2004	2005	2006
Production (in tonnes)	71	84	93	97	103	114	118

- Fit a straight line trend by method of least square. [7]

OR

- c) Assuming 5 yearly moving average calculate trend values from the data given below. Plot the trend values and estimate the trend. [7]

Year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Production	106	109	111	117	119	116	120	127	125	129	132	134	131

- d) Two independent samples of 9 and 8 items are given below. [7]

Sample A	13	18	17	20	21	19	24	15
Sample B	14	16	21	23	22	18	20	

Examine whether means of two samples are equal at 5% level of significance.



Total No. of Questions : 6]

SEAT No. :

P6967

[Total No. of Pages : 3

[5865]-25

**F.Y. MCA (Management)**

**BM 21: PRINCIPLES AND PRACTICES OF MANAGEMENT  
AND ORGANIZATIONAL BEHAVIOR**

**(2019 Pattern) (Semester - II)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

**Q1)** Shreeya and Aanand both are working for a software company. The manager of the new product division was originally the leader of the project team for which she interviewed and hired Aanand. Shreeya, was another project team member, also interviewed Aanand, but strongly opposed hiring him for the project because she thought he was not competent to do the job.

Seven months after Aanand was hired, the manager left the project to start her own company and recommended that Aanand and Shreeya serve as joint project leaders. Shreeya agreed reluctantly with the stipulation that it be made clear she was not working for Aanand. The General Manager consented; Shreeya and Aanand were to share the project leadership.

Within a month Shreeya was angry because Aanand was representing himself to others as the leader of the entire project and giving the impression that Shreeya was working for him. Now Shreeya and Aanand are meeting with you to see if you can resolve the conflict between them.

Shreeya says: "Right after the joint leadership arrangement was reached with the General Manager, Aanand called a meeting of the project team without even consulting me about the time or content. He just told me when it was being held and said I should be there. At the meeting, Aanand reviewed everyone's duties line by line, including mine, treating me as just another team member working for him. He sends out letters and signs himself as project director, which obviously implies to others that I am working for him."

*P.T.O.*

Aanand says: “Shreeya is all hung up with feelings of power and titles, Just because I sign myself as project director doesn’t mean she is working for me. I don’t see anything to get excited about. What difference does it make? She is too sensitive about everything. I call a meeting and right away she thinks I’m trying to run everything. Shreeya has other things to do other projects to run so she doesn’t pay too much attention to this one. She mostly lets things slide. But when I take the initiative to set up a meeting, she starts jumping up and down about how I am trying to make her work for me.”[10]

Questions:

- i. Identify the types of the individual conflicts discussed between Shreeya and Aanand.
- ii. What are the possible ways to deal with the conflicts between Aanand and Shreeya? Also give suggestions to avoid this conflict in the first place?

**Q2)** Explain any two types of leadership styles with suitable examples. [10]

**Q3)** “Garry was a team member with whom many of the colleagues were not ready to work with. The reasons could include his nature of hiding the necessary details from the colleagues and being very possessive and dominating in the group meeting though he may or may not be correct every time.” In the light of given scenario, identify the type of ego state and explain the suitable transactional analysis in the case. [10]

**Q4)** Define and explain the concept of ‘Team’. What are various features of team which make a team different than a group? [10]

**Q5)** What is ‘Bounded Rationality’? Explain Herbert-Simon’s model of decision making. [10]

**Q6)** Write short notes on any 4 out of the following :

**[20]**

- a) Planning.
- b) Principles of Scientific Management.
- c) Territorial Organization.
- d) Managerial Levels and respective functions.
- e) Types of Corporate Culture.





Total No. of Questions : 7]

SEAT No. :

**P6968**

[Total No. of Pages : 2

**[5865]-31**  
**MCA (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 diagram wherever necessary.*

**Q1)** Answer in short (Any Five) : **[10]**

- a) What is garbage collection?
- b) What is JVM in Java?
- c) What is Runnable Interface?
- d) What is inheritance in Java?
- e) What is abstract class in Java?
- f) What is Buffered Reader?

**Q2)** Create thread using Runnable Interface. **[10]**

OR

Explain 2D Assay with example. **[10]**

**Q3)** What is linked list in collection framework? Explain with example. **[10]**

OR

What is the difference between set and sorted set. **[10]**

*P.T.O.*

**Q4)** What is the difference between AWT & SWing? [10]

OR

Explain Event delegation model with diagram. [10]

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

OR

Explain Session tracking in servlet with example. [10]

**Q6)** Write JSP program to register blood donor. [10]  
(Assume suitable table structure)

OR

Explain types of statements. [10]

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

- a) RMI.
- b) TCP/IP.
- c) Java Beem.
- d) MVC.



Total No. of Questions : 8]

SEAT No. :

P6969

[Total No. of Pages : 2

[5865]-32

MCA (Management)

IT 32: DATA WAREHOUSING & DATA MINING

(2019 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates :

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

Q1) What is regression and explain the types of regression. [10]

Q2) What is OLAP? What are different OLAP operations with example. [10]

Q3) A database has four transactions. Let min-Sup = 60% and min-conf = 80%. [10]

TID	Date	Items-bought
100	10/12/21	{K, A, B, D}
200	10/12/21	{D, A, C, E, B}
300	10/11/21	{C, A, B, E}
400	10/22/21	{B, A, D}

- a) Find all frequent items using FP-growth algorithm.
- b) List all of the strong association rules (with support S and confidence C) Matching the following metarule where x is a variable representing customers & item i denotes variables representing items (e.g, "A", "B" etc.)  $V \times E$  transactions,  $\text{buys}(X, \text{item 1}) \wedge \text{buys}(X, \text{item 2}) = \text{buys}(X, \text{item 3}) [S, C]$ .

P.T.O.

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

**Q5)** Explain K-means algorithm with example. **[10]**

**Q6)** What is a decision tree? How a decision tree works? **[10]**

**Q7)** Discuss the K-nearest neighbour classification algorithm with suitable example. **[10]**

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

- a) Components of datawarehouse.
- b) Temporal and spatial data mining.
- c) Genetic algorithm.
- d) Knowledge Discovery Process (KDP).



Total No. of Questions : 7]

SEAT No. :

**P6970**

[Total No. of Pages : 4

**[5865]-33**

**S.Y. 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 82g test plan template for a Railway Reservation System **[10]**

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

**Q2)** a) Distinguish between Software Quality Assurance and Quality control. **[8]**  
b) Define MTTF and MTTR. **[2]**

OR

- a) Elaborate on the categories and factors of Mc call's classic factor model. **[7]**
- b) Define Software Quality Metrics with an example. **[3]**

**Q3)** a) Define software Testing and Explain testing Principles. **[8]**  
b) Explain load testing. **[2]**

OR

- a) Explain W model. **[8]**
- b) Explain Regression testing. **[2]**

**P.T.O.**

**Q4) A)** Solve the following :

- i) Find the minimum number of test cases required to guarantee 100% decision coverage for the following code. [3]

```
Input Exam score
If Exam score < = 75 then
    Print "Failed"
Else
    Print "Passed"
If Exam score > = 120 then
    Print " Distinction"
End IF
End IF
```

- ii) Find the minimum tests required for statement and Branch coverage for the following : [3]

```
Read P
Read Q
IF p + q > 100 then
    Print "Large"
End if
If p > 50 then
    Print "P Large"
End if
```

- iii) An input field takes the year of birth between 1900 and 2004. Mention the boundary values required for testing this field. [2]

B) Define structural testing. [2]

OR

A) Solve the following :

i) In a system designed to work out the tax to be paid: An employee has Rs. 4000 of salary tax free. The next Rs. 1500 is taxed at 10% The next Rs. 28,000 is taxed at 22%. Any further amount is taxed at 40%. Which of these groups of numbers would fall into the same equivalence class? [3]

a) Rs. 4800; Rs. 14000; Rs. 28000

b) Rs. 5200; Rs. 5500; Rs. 28000

c) Rs. 28001; Rs. 32000; Rs. 35000

d) Rs. 5800, Rs. 28000; Rs. 32000

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

Discount rate = 1;

Fare = 1000;

If (Person = "Senior Citizen") and (Travel Month = "January")

Bonuspoints = 100 + Bonuspoints

If (Class = "First")

Discount Rate = .5;

Fare = Fare \* Discount Rate;

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

a) 3, 4, 24, 25

b) 2, 3, 25, 26

c) 2, 3, 24, 25

d) 3, 5, 25, 26

B) Define specification based testing. [2]

**Q5) a)** Write 4 test cases for testing Login functionality in a typical application. **[10]**

OR

b) Write any 4 tests cases for ATM. **[10]**

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

b) Mention the selenium suite components. **[4]**

OR

a) Explain how testing tools support static testing. **[6]**

b) Write short note on Performance testing. **[4]**

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

a) Inspection Process.

b) Objectives of testing.

OR

a) Review Techniques.

b) SQA building blocks.





Total No. of Questions : 8]

SEAT No. :

**P8371**

[Total No. of Pages : 2

**[5865] - 34**

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

**TI - IT34 - CLOUD COMPUTING**

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates :*

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

*Q1)* What is Virtualization? Why is it required? Explain benefits of Virtualization. **[10]**

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

*Q3)* Explain types of Virtual Machine with examples. **[10]**

*Q4)* Explain Web (1.0, 2.0 & 3.0) and Web Operating System. **[10]**

*Q5)* Explain Streaming issues in Cloud Computing. **[10]**

*Q6)* Define Cloud Computing. Explain Cloud Services Model and Types with example. **[10]**

**P.T.O.**

**Q7) Explain Cloud benefits and its limitations.**

**[10]**

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

**[10]**

- a) SoA.
- b) Web Services.
- c) Paas.



Total No. of Questions : 8]

SEAT No. :

P6971

[Total No. of Pages : 3

[5865]-35

S.Y. 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 maximum marks.
- 4) Use of non-programmable calculator and statistical table is allowed.

Q1) Solve any three subquestions out of 5 (5 marks each) : [3 × 5 = 15]

- a) 5 persons are seated on 5 chairs at a round table. Find the probability that two specified persons are seating next to each other.
- b) Among 60 students in a class, 45 passed in mathematics and 22 failed in statistics. If 11 students passed in both subjects, how many students failed in both?
- c) If a pair of dice is thrown, find the probability that the sum of digits on them is neither 7 or 11.
- d) A random variable X has the following probability distribution.

$x:$       -2      -1      0      1      2      3

$p(x):$  0.1      k      0.2      2k      0.3      3k

- i) Find k,      ii) Evaluate  $p(x < 2)$  and      iii)  $p(-2 < x < 2)$

- e) If random variable x has p.m.f.  $p(x) = \binom{10}{x} q^{10-x} \left(\frac{1}{2}\right)^x$ . Find mean variance of x &  $p(x=2)$ .

P.T.O.

- Q2) a)** A bag contains 30 balls numbered from 1 to 30. One ball is drawn at random. Find the probability that the number of ball drawn will be. [5]
- multiple of 5 or 7
  - a multiple of 4 or 6
  - even number or multiple of 5
- b) If 5% of electric bulbs manufactured by a company are defective, use Poisson Distribution to find the probability that in a box of 100 bulbs : [5]
- None is defective
  - 3 bulbs are defective
  - More than 3 bulbs are defective ( $e^{-5} = 0.007$ )

- Q3) a)** A company uses a 'selling aptitude test' in the selection of salesmen. Past experience has shown that only 70% of all persons applying for sales position achieved a classification "dissatisfactory" in actual selling, whereas the remainder were classified as "satisfactory", 85% had scored a passing grade on the aptitude test. Only 25% of those classified unsatisfactory, had passed the test on the basis of information. What is the probability that a candidate would be satisfactory salesman given that he passed the aptitude test? [5]
- b) If  $p(A) = 0.4$ ,  $p(B) = 0.7$  and  $p(\text{at least one of A and B}) = 0.8$  find  $p(\text{only one of A and B})$ . [5]

- Q4) a)** The joint probability mass function of  $(x,y)$  is given by  $p(x,y) = k(2x+3y)$ ,  $x = 0, 1, 2$ ;  $y = 1, 2, 3$ .  
Find all the marginal and conditional probability distributions. Also, find the probability distribution of  $(x + y)$  [5]
- b) Determine  $k$  such that the following functions are p.m.f.s. [5]
- $p(x) = kx$  for  $x = 1, 2, 3, \dots, 10$
  - $p(x) = k \frac{2^x}{x!}$  for  $x = 0, 1, 2, 3$
  - $p(x) = k(2x^2+3x+1)$  for  $x = 0, 1, 2, 3$

**Q5) a)** If X is uniform distributed over (0, 10), calculate the probability that [5]

- i)  $X < 3$
- ii)  $X > 6$
- iii)  $3 < X < 8$

b) Obtain approximation of Binomial distribution as Poisson distribution. [5]

**Q6) a)** A restaurant serves two special dishes, A and B so its customers consists of 60% men and 40% women 80% of men order dish A and the rest B 70% of women order B and the rest A. In what ratio of A to B should the restaurant prepare the two dishes? [5]

b) A random variable X is defined as the sum of faces when a pair of dice when thrown. Find expected value of X. [5]

**Q7) a)** A continuous RVX has a pdf  $f(x) = kx^2e^{-x} \ x \geq 0$ . Find k, mean and variance. [5]

b) If X is a discrete random variable whose pmf is [5]

$$p(x=i) = k(i+1) \quad i = 1, 2, 3, 4, 5, 6$$

- i) Find k,
- ii)  $p(x \leq 4/x > 1)$

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

a) How many ways five boys can sit

- i) in a row
- ii) around circle

b) What is the coefficient of  $x^5y^8$  in the expansion  $(x+y^2)^9$ ?

c) A deck of 52 playing cards is distributed randomly to 4 players. Find the probability that each player gets exactly one ace.

d) p.d.f. of a continuous random variable is given by

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

- i) Find k
- ii) Find  $p(x < 1/2)$

e) Two fair dice are thrown and X denote the absolute difference between the two scores and y denotes the maximum of two scores. Find joint p.m.f. of (x,y).



Total No. of Questions : 7]

SEAT No. :

**P6972**

[Total No. of Pages : 2

**[5865]-41**

**S.Y. M.C.A.**

**IT41 : PYTHON PROGRAMMING**

**(2019 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q. No.1 and 7 are compulsory.*
- 2) *Solve any four questions from 2 to 6.*
- 3) *Figures to the right indicate marks.*

**Q1)** a) Write a python program to check whether the given string is palindrom or not using function. **[5]**

b) What is lambda function in python? Explain with any (one) example.**[5]**

**Q2)** a) What is string? Explain any five string functions with proper example.**[5]**

b) Print odd numbers between 1 to 100 using for loop. **[5]**

**Q3)** Write a python program to implement student class which has method to calculate percentage. Assume suitable class variable. **[10]**

**Q4)** a) Write a python program to extract email from text file. **[5]**

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

**Q5)** Draw pie chart and bar chart using library of python with suitable example.**[10]**

***P.T.O.***

- Q6)** a) How many ways Data frame can be created using pandas. [5]  
b) Explain Decorators and Generators in python. [5]

**Q7)** Write a short note (any four) : [4 × 5 = 20]

- a) read ( ), readline ( ), readlines ( )
- b) SQL Database connection using python
- c) Super class
- d) Matplotlib
- e) Synchronizing the threads



Total No. of Questions : 7]

SEAT No. :

**P8047**

[Total No. of Pages : 2

**[5865]-42**

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

**IT - 42 : ESSENTIALS OF ARCHITECTURAL  
FRAMEWORK**

**(2019 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1) a) Explain the various domain Enterprise Architecture. [8]**

b) Explain Business Process Framework (eTOM). [7]

**Q2) What is the Application Architecture implementation? [10]**

**Q3) What is the applicability of frameworks in the various stages of SDLC phases. [10]**

**Q4) What is projects in controlled Environments (PRINCE 2). [10]**

**Q5) What are architectural design patterns and explain its use in detail. [10]**

**Q6) Explain the ZACHMAN framework in detail. [10]**

***P.T.O.***



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

**[3 × 5 = 15]**

- a) Six Sigma
- b) Treasury Enterprise Architecture framework (TEAF).
- c) The Federal Enterprise Architecture Framework (FEAF).
- d) Programming Language Frameworks.
- e) Managing Successful Programme (MSP).



Total No. of Questions : 5]

SEAT No. :

P6973

[Total No. of Pages : 2

[5865]-43

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

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

**(2019 Pattern) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** a) What are informed search methods? Explain greedy best first search algorithm. **[10]**

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

**Q2)** Explain the architecture of simple reflex agent. **[10]**

OR

Describe different task domains of Artificial Intelligence. **[10]**

**Q3)** a) Explain any two inference rules with suitable example. **[10]**

OR

Explain and Define

i) Valid Arguments

ii) Truth Values

**Q4)** What are the different applications of AI? Explain Natural Language processing in detail. **[10]**

OR

Explain Artificial neural network in detail. **[10]**

*P.T.O.*

**Q5)** Write a short notes (any four) :

**[20]**

- a) Hierarchical Planning
- b) Conditional planning
- c) Reinforcement learning
- d) Bayes Theorem
- e) Inference in belief network



Total No. of Questions : 8]

SEAT No. :

P7493

[Total No. of Pages : 3

[5865]-44

MCA (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 on right side indicate full marks.

- Q1) a) A job production unit has four jobs A,B,C & D which can be manufactured on each of the four machines P,Q,R & S. The processing cost of each job for each machine is given in the table below : [10]

Jobs	Machines			
	P	Q	R	S
	Processing cost (₹)			
A	31	25	33	29
B	25	24	23	21
C	19	21	23	24
D	38	36	34	40

To achieve minimum processing cost which job will you process on which machine?

- b) Solve the given LPP graphically [10]

$$\text{Maximize } Z = 15X_1 + 10X_2$$

Subject to constraints,

$$4X_1 + 6X_2 \leq 360$$

$$3X_1 + 0X_2 \leq 180$$

$$0X_1 + 5X_2 \leq 200$$

$$\text{and } X_1, X_2 \geq 0$$

P.T.O.

- Q2)** A TV dealer finds that cost of a TV in stock for a week is ₹30 and cost of a unit shortage is ₹70. For one particular model of TV, the probability distribution of weekly sales is as follows : [10]

Weekly sales	0	1	2	3	4	5	6
Probability	0.10	0.10	0.20	0.25	0.15	0.15	0.05

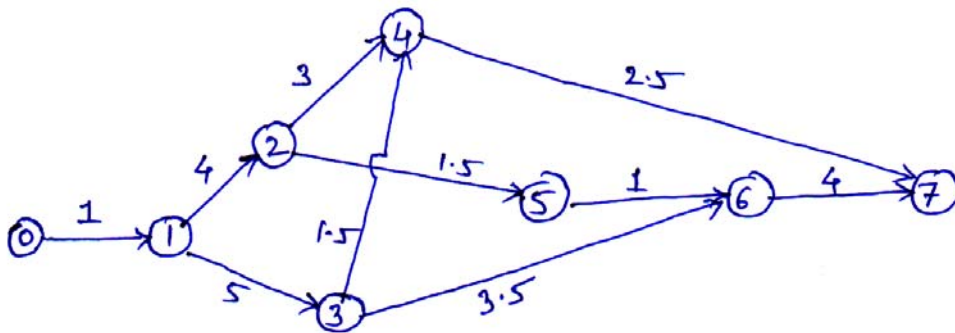
How many units per week should the dealer order?

- Q3)** Reduce the following game by dominance. [10]

Player B

		B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	B <sub>4</sub>	B <sub>5</sub>
Player A	A <sub>1</sub>	2	4	3	8	4
	A <sub>2</sub>	5	6	3	7	8
	A <sub>3</sub>	6	7	9	8	7
	A <sub>4</sub>	4	2	8	4	3

- Q4)** The network shown in figure, determine the total tree and independent floats and identify the critical path. [10]



- Q5)** A machine owner finds that from his past records that cost per year of maintaining a machine whose purchase price ₹6000/- are given. [10]

Year	1	2	3	4	5	6	7	8
Maintenance cost (₹)	1000	1200	1400	1800	2300	2800	3400	4000
Resale Price (₹)	3000	1500	750	375	200	200	200	200

Determine at what age is a replacement due?

**Q6)** 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 :

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

**Q7)** Seven jobs go first over machine 1 and then over machine 2. Processing time in hours are given as : **[10]**

Job	A	B	C	D	E	F	G
Machine 1	6	24	30	12	20	22	18
Machine 2	16	20	20	12	24	2	6

Find :

- a) Optimum order
- b) Total elapsed time
- c) Idle time for Machine 1 & Machine 2

**Q8)** The number of customers at a restaurant each evening is distributed as shown: **[10]**

Number of customers	Lots	Average	Very few
Probability	0.2	0.4	0.4

The chef refuses to work on an evening when there are very few customers and walks out. He will not work until an evening when there are lots of customers, although he always comes-in on Friday because he gets paid them. Find the fraction of evening that the chef is at the restaurant.

[Use random numbers: 3, 5, 1, 8, 6, 6, 4, 4, 0]



Total No. of Questions : 6]

SEAT No. :

**P6974**

[Total No. of Pages : 2

**[5865]-45**

**MCA (Management Faculty) (Semester - IV)**

**BM-41 : INFORMATION SYSTEM & SECURITY AUDIT**

**(2019 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** Agile Communication Pvt Ltd. is a firm providing customer and internet banking facilities. Its main customers are so the biggest banks of Ukraine. Its employees, who have access to all the financial accounts, personal data and credit card information of approximate 10 million clients of these banks. You have been deputed as Information security manager and have been allocated the duty to scrutinize the possible security breaches which might occur. **[10]**

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

**Q2)** a) Explain 3 pillar's (CIA) of Information security. **[5]**

b) Write steps for developing ISMS. **[5]**

**Q3)** Indrayani sugar factory decided to computerise their operations by using SMS plugging services for communicating with sugarcane farmers. You have been deputed by your software firm as information security policy maker for this sugar factory. **[10]**

- a) Which security model you will going to suggest and implement.
- b) What security standards you will going to propose for practicing in above case.

**P.T.O.**

**Q4)** What is information security controls? Explain various Information security controls. **[10]**

**Q5) a)** Govt. of India planning to implement online voting system for all types of elections of our country. 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) Write key success factors for this system security audit.

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

**OR**

**a)** Trading company is implementing ERP system for their day today operation. 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 - ITIL. **[10]**

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

a) Functions of IS auditor

b) Database security

c) IS audit Approaches

d) Ethical Hacking





Total No. of Questions : 8]

SEAT No. :

**P6975**

[Total No. of Pages : 2

**[5865]-51**

**M.C.A. (Management) (Semester - V)**

**IT-51 : SOCIAL MEDIA AND DIGITAL MARKETING**

**(2019 Pattern)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** A newly established start-up company per pates spare parts for mobile phones for growth of their business they are in process of Digital Marketing with help of Facebook Marketing and twitter Marketing, being Digital Marketing Executive how will you create and promote their Digital Marketing plat form. **[10]**

**Q2)** How Digital Marketing is different than Traditional Marketing with respect to Return on Investment (ROI)? **[10]**

**Q3)** Explain in detail various strategies for Digital Marketing. **[10]**

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

**Q5)** What is off page optimization? Explain How it works? **[10]**

**Q6)** Explain various tools of social media and Digital Marketing? **[10]**

**Q7)** Explain PPC (Pay Per Click) Technique and Google Adwords in Search Engine Marketing (SEM)? **[10]**

**P.T.O.**

**Q8)** Write short notes on (Any two) :

**[10]**

- a) Google Analytics
- b) SWOT Analysis of Business
- c) Free Classifieds



Total No. of Questions : 7]

SEAT No. :

P6976

[Total No. of Pages : 1

[5865]-52

T.Y. MCA (Semester - V)

IT-52 : MOBILE APPLICATION DEVELOPMENT

(2019 Pattern)

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

*Q1)* Explain android architecture in detail. **[10]**

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

*Q3)* Write an application to demonstrate options and content menu in Android. **[10]**

*Q4)* Write an android application using SQLite to create courses table (Course-Id, Course\_name, Course\_duration, Course\_fees). Write a code to insert and delete records. **[10]**

*Q5)* Explain XML parsing Demonstrate it with appropriate example. **[10]**

*Q6)* Explain React Native geolocation API with appropriate example. **[10]**

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

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



Total No. of Questions : 6]

SEAT No. :

**P6977**

**[5865] - 53**

[Total No. of Pages : 2

**T.Y.M.C.A. (Management Faculty)**  
**IT53 : SOFTWARE PROJECT MANAGEMENT**  
**(2019 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**Q1)** Attempt the following. (Any 4).

**[4×5=20]**

- a) Enumerate the benefits of Agile project management.
- b) Explain in brief sprint Retrospective.
- c) Short note on Product Roadmap.
- d) Explain the 4p's of project management.
- e) Delphi Estimation Technique.
- f) Swimlanes in Agile.

**Q2)** a) Explain Software Project Management Life Cycle in brief.

**[5]**

- b) List five software project risks and explain the strategies for reducing those risks. **[5]**

OR

a) Describe Project and its characteristics.

**[5]**

- b) Elaborate on the roles and responsibilities of a Project Manager. **[5]**

**Q3)** You as a Project Manager are required to give Efforts Estimation for a project of size 240 KLOC for all classes of project.

In addition project also requires.

**[10]**

- a) Storage constraint is High(1.06)
- b) Programmes capability is Low (1.17)
- c) Data base size is Low(0.94)
- d) Remaining all drivers are treated as Nominal

OR

**P.T.O.**

Consider a project with following functional units.

- 1) No. of user Inputs - 55
- 2) No. of user Outputs - 25
- 3) No. of user Enquiries = 30
- 4) No. of user files = 05
- 5) No. of External Interfaces = 02

In addition to the above, system requires.

- a) Critical level of Data communication.(5)
- b) Code Reusability (4)
- c) Performance is Significant (4)
- d) System is not designed for multiple instalations (0)
- e) Other complexity factors are treated as average.

Compute Function Points for this project when the weighting factors are average. [10]

- Q4)** a) Elaborate on the agile Concept - Story ponits. [5]  
b) Explain the four values of Agile Manifesto with its meaning. [5]

OR

- a) Explain Product Backlog and Sprint Backlog in brief. [5]
- b) Short note on Scrum events. [5]

- Q5)** a) Briefly explain the roles and responsibilities of a scrum master. [5]  
b) Discuss Dynamic System Development Method Life Cycle. [5]

OR

- a) Explain value Driven Development in brief. [5]
- b) Discuss the use of Burn down chart in Agle Projects. [5]

- Q6)** a) Explain any two Agile project key metrics. [5]  
b) Explain planning Poker story point estimation technique. [5]

OR

Scenario: User wants to request cash from his/her account at any ATM.

- a) Write user story for the scenario above. [5]
- b) Write an Acceptance criteria for the user story in Given/ When/ Then format. [5]



Total No. of Questions : 4]

SEAT No. :

P8418

[Total No. of Pages : 3

[5865]-61

M.C.A. (Management Faculty)

MT-21 : DISCRETE MATHEMATICS

(2015 Pattern) (Semester - II)

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 & 4.
- 3) Figures to the right indicate full marks.
- 4) Use of scientific calculator is allowed.

Q1) a) Show that  $(\neg P \wedge (\neg Q \wedge R)) \vee ((Q \wedge R) \vee (P \wedge R)) \Leftrightarrow R$ . [5]

b) Let  $X = \{a, b, c\}$ .  $f, g$  and  $h$  be the relations defined on  $X$  given by

$$f = \{(a, a) (b, a) (c, a)\}$$

$$g = \{(a, b) (b, c) (c, a)\}$$

$$h = \{(a, b) (a, c) (b, c) (c, a)\}$$

Determine which of the following are injective and surjective function. [5]

c)  $R = \{(1, 1) (1, 3) (1, 4) (2, 1) (2, 3) (2, 5) (3, 2) (3, 4) (4, 2) (4, 3) (5, 1) (5, 2) (5, 5)\}$ . Let  $R$  be the relation defined on  $A = \{1, 2, 3, 4, 5\}$ . Draw matrix and digraph of  $R$ . [5]

d) Check whether the given statements are tautology or contradiction [5]

i)  $\neg(p \wedge q) \leftrightarrow \neg p \vee \neg q$ .

e) Define with illustration. [5]

i) Abelian group

ii) Universal Quantifier

iii) Existential Quantifier

f) Find all distinct left cosets of  $(4\mathbb{Z}, +)$  in  $(\mathbb{Z}, +)$  where  $4\mathbb{Z}$  is set of all multiples of 4. [5]

P.T.O.

**Q2) a)** Show that the given set of premises are inconsistent [5]

$A \rightarrow (B \rightarrow C), D \rightarrow (B \wedge \neg C)$  and  $A \wedge D$ .

b) Check whether following is tautology or contradiction

$((P \rightarrow R) \wedge (\neg Q \wedge P)) \leftrightarrow ((P \vee Q) \wedge (P \vee R))$ . [5]

c) Find PDNF for the following [5]

$((P \wedge Q) \vee (\sim P \wedge R) \vee (Q \wedge R))$ .

d) Write the following statement in symbolic form [5]

i) Every apple is red

ii) Some men are clever

**Q3) a)** Let  $R = \{(1, 1) (1, 2) (2, 3) (3, 1) (4, 2) (4, 3)\}$  and  $S = \{(2, 3) (3, 4) (4, 4) (4, 1) (3, 2) (1, 2)\}$  Find  $S \circ (S \circ R)$  and  $(R \circ S) \circ R$ . [5]

b) Let  $G$  be the set of all non zero numbers and  $a * b = \frac{ab}{2}$ . Show that  $(G, *)$  is an abelian group. [5]

c) Let  $A = \{a, b, c, d\}$  with relation

$R = \{(a, a) (a, c) (b, a) (b, c) (c, b) (c, d) (d, b) (d, d)\}$

Find transitive closure of  $R$  using Warshall's algorithm. [5]

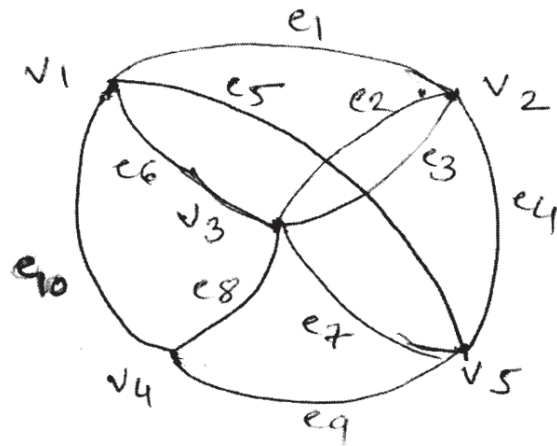
d) Define Semigroup & cyclic group with example. [5]

**Q4) a)** Find the code words generated by the parity - check matrix  $H$  where

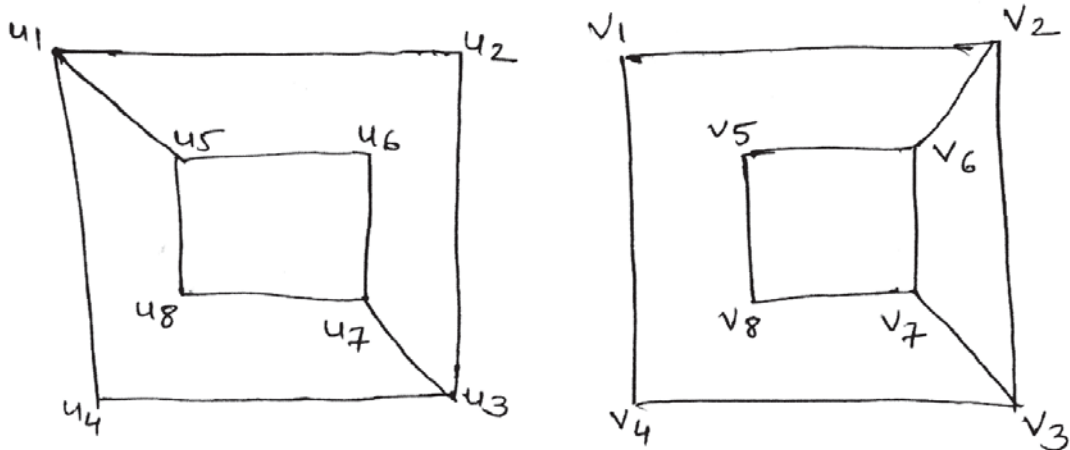
$$H = \begin{bmatrix} 1 & 0 & 1 & 1 & 0 & 0 \\ 1 & 1 & 0 & 0 & 1 & 0 \\ 1 & 1 & 1 & 0 & 0 & 1 \end{bmatrix}. \quad [5]$$

b) Show that a simple group with  $n$  vertices has maximum  $\frac{n(n-1)}{2}$  edges. [5]

c) Construct adjacency & incidence matrix for the following graph. [5]



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





Total No. of Questions : 7]

SEAT No. :

**P8419**

[Total No. of Pages : 2

**[5865]-62**

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

**T1 - IT33 : OBJECT ORIENTED ANALYSIS AND DESIGN  
(2015 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Q1 and Q7 are compulsory.*
- 2) *Solve any four from the remaining.*
- 3) *Mention assumptions made for solving the case studies.*

**Q1)** A computerised library system for a university keeps track of all books, periodicals and journals in the library and their issue status Issue and return are automated through a barcode reader. The library system also interfaces with an external relational database which stores information about the library users (Students, faculty, staff). Library users can access catalog and recall books, periodicals and journals.

Draw the following diagrams for the above case :

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

**Q2)** Explain various approaches for identifying classes. [10]

- Q3)** a) Draw a sequence diagram for forwarding SMS to someone from the contact list. [5]
- b) Draw an activity diagram for business order processing system in which the input parameter is the requested order and once the order is accepted, all of the required information is filled, payment is accepted and then the order is shipped. It permits order shipment before payment is completed [5]

**P.T.O.**

- Q4)** a) Write short notes on-Component and Deployment diagram. [5]
- b) Draw State Transition Diagram for vacuum cleaner. The cleaner can operate in dry and wet modes. In dry mode it can be set to high/low sucking capacity if the cleaner is over loaded with dust, alarm is fired and switched off. [5]

**Q5)** Elaborate Rup process in detail. [10]

**Q6)** Explain OMT in detail. [10]

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

- a) Aggregation and composition.
- b) Patterns.
- c) Polymorphism.



Total No. of Questions : 7]

SEAT No. :

**P8437**

[Total No. of Pages : 2

**[5865]-63**

**M.C.A. (Management Faculty)  
T1 - IT51 : ASP. NET USING C#  
(2015 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Question 2 & 7 are compulsory.*
- 2) *Solve any four from the remaining.*
- 3) *Figures to the right indicate full marks.*

**Q1)** Explain. NET architecture in details. **[10]**

**Q2)** Design ASP.NET form and write code for Hospital Management System to perform following tasks : **[15]**

- a) Add record of patients in the database.
- b) Display all records of patients in Grid View control from database.

(Note : Assume required table with suitable field & database)

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

**Q4)** Explain ASP. Net page life cycle in details. **[10]**

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

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

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

**P.T.O.**

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

**[15]**

- a) Web Service.
- b) IIS.
- c) MVC.
- d) Authentication.



Total No. of Questions : 8]

SEAT No. :

**P8420**

[Total No. of Pages : 1

**[5865]-64**

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

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

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

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

*Q1) Explain the concept of SOA, Explain common misperception about SOA.[10]*

*Q2) Explain different message exchange pattern in brief. [10]*

*Q3) Explain SOA delivery strategies with the agile strategy. [10]*

*Q4) Explain WSDL language basics with suitable example. [10]*

*Q5) Explain anatomy of SOA with ticket booking case. [10]*

*Q6) Describe WS coordination framework and explain its stages with suitable example. [10]*

*Q7) Explain common principles of service orientation. [10]*

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

- a) SOA extensions*
- b) SOA standards*
- c) Automic transactions*



Total No. of Questions : 7]

SEAT No. :

**P8421**

[Total No. of Pages : 1

**[5865]-65**

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

**T1-IT53: BIG DATA ANALYTICS**

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

*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 side indicate full marks.*

*Q1)* What is Big Data? Explain Big Data implications for any one industry. [10]

*Q2)* Compare between BDW and EDW design principles. [10]

*Q3)* What is Map-reduce? Explain with the help of example. [10]

*Q4)* What is NoSQL? Compare between Cassandra and HBase. [10]

*Q5)* Explain Big Data workload design approaches. [10]

*Q6)* What is Hadoop? Explain components of Hadoop Framework. [10]

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

- a) Cap theorem.
- b) In-Memory database Grid.
- c) Scale-out Architecture.
- d) RDBMS Vs. Non-Relational Databases.
- e) ACID Vs BASE.

