

Total No. of Questions : 12]

SEAT No. :

P746

[4366]-101

[Total No. of Pages : 2

F.Y. M.C.A. (Engineering Faculty) (Semester - I)
PROBLEM SOLVING AND PROGRAMMING IN C
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer any three questions from each section.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*
- 6) *Steps of Hand running must be shown wherever output of the program is asked.*

SECTION - I

- Q1)** a) What is flow charts? Explain basic notations of flowchart with example. [6]
b) Explain an algorithm development to find a factorial of a given number. [6]

OR

- Q2)** a) Explain a program for generating all prime numbers which are less than 1000. [6]
b) What is complexity of algorithm? Explain with example. [6]

- Q3)** a) Write down different operators in C. What is precedence of operator? [6]
b) Write a program to check whether a number is Armstrong number or not. [6]

OR

- Q4)** a) What is recursive function? Write a program to calculate factorial of given number using recursion. [6]
b) What is Local and Global variable. What is meant by the scope of a variable. [6]

- Q5)** a) What is array? Explain types of array with example. [6]
b) Write a program to accept two strings from user and concatenate the 1st string at the end of 2nd string without using library function, and display the resultant string. [5]

OR

- Q6)** a) List out any five string library function used in C with their Syntax and example. [6]

P.T.O.

- b) Write a program to accept a string from user and display the number of alphabets, words and numbers present in the given string. [5]

SECTION - II

- Q7)** a) What is function? Explain call by value and call by reference with example. [6]
b) Write a program to accept a string from user and replace all the vowel with * and all the consonants with # using pointer, and display the resultant string. [6]

OR

- Q8)** a) What is pointer? Explain the benefits of pointers with example. [6]
b) What is Dynamic Memory Allocation? Explain any two library functions for dynamic memory allocation with examples. [6]

- Q9)** a) What is structure? Explain the difference between array and structures. [6]
b) What is command line argument? Explain the steps to accept two numbers using command line argument. [6]

OR

- Q10)** a) Create a structure item having item Id, Name and Price, Accept the details for 50 records and find out the item having highest price and lowest price. Display the report. [6]
b) Explain the various storage classifiers in C. [6]

- Q11)** a) Write a program to read the contents of a text file and copy all the characters into another text file in upper case. [6]
b) Explain fgetc(), fputc and fread() function with example. [5]

OR

- Q12)** a) Write a program to accept two file name using command line and copy the content of one file into another file. [6]
b) Differentiate between low level & high level I/O. [5]



Total No. of Questions : 12]

SEAT No. :

P747

[Total No. of Pages : 4

[4366] - 102

F.Y. M.C.A. (Engineering Faculty) (Semester - I)

DISCRETE MATHEMATICS

(2008 Pattern)

Time :3 Hours]

[Max. Marks :70

Instructions to the candidates:-

- 1) *Answer any three questions from each section.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Assume suitable data, if necessary.*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*

SECTION - I

Q1) a) Among 50 students in a class, 26 got an A in the first examination and 21 got an A in the second examination. If 17 students did not get an A in either examination, how many students got an A in both examinations?

[5]

b) State the principal of mathematical induction & prove the following proposition.

[6]

$$P(n) = 1 + 4 + 7 + \dots + (3n - 2) = n(3n - 1)/2.$$

OR

Q2) a) A college record gives the following information: 150 students enrolled in Computer Science; out of these 100 took Data Structures, 45 took discrete math, 42 took Assembly language, 25 took both discrete math and Assembly Language, 32 took both Data structures and Assembly Language, 38 took Data Structures and discrete math and 22 took all the three courses. Is the information correct? Why?

[5]

b) Out of integers 1 to 2000.

[6]

i) How many are not divisible by 3 nor by 7?

ii) How many are not divisible by 5 & 7 but divisible by 3?

P.T.O

- Q3)** a) Obtain DNF of **[4]**
- i) $(p \rightarrow q) \wedge (p \leftrightarrow q)$
 - ii) $(p \wedge (p \rightarrow q)) \leftrightarrow q$
- b) $P \rightarrow (Q \vee R) \Leftrightarrow (P \rightarrow Q) \vee (P \rightarrow R)$ **[4]**
- c) For the universe of all integers, let $P(x)$, $Q(x)$, $R(x)$, $S(x)$ and $T(x)$ be the following statements: **[4]**

$$P(x) : x > 0$$

$$Q(x) : x \text{ is even}$$

$$R(x) : x \text{ is a perfect square}$$

$$S(x) : x \text{ is divisible by 4}$$

$$T(x) : x \text{ is divisible by 5}$$

Write the following statement in symbolic form.

- i) At least one integer is even
- ii) There exists a positive integer that is even
- iii) If x is even, then x not is divisible by 5
- iv) No even integer is divisible by 5

OR

- Q4)** a) Determine whether the following is a tautology, contingency or a contradiction. **[6]**
- i) $(p \wedge q) \rightarrow p$
 - ii) $p \rightarrow (q \rightarrow p)$
 - iii) $(p \wedge (\sim p \vee q)) \wedge \sim q$
- b) There are two restaurants next to each other. One has a sign that says “Good food is not cheap” and the other has a sign that says “cheap food is not good”. Prove that both the statements are logically equivalent using truth table. **[6]**

- Q5)** a) In how many ways can we select a committee of 4 republicans, 3 democrats, and 2 independents, from a group of 10 distinct republicans, 12 distinct democrats, & 4 distinct independents? **[6]**
- b)
 - i) Suppose that repetitions are not permitted, then how many 4 digit numbers can be form the six digits 1,2, 3, 5, 7, 8?
 - ii) How many such numbers are less than 5000?
 - iii) How many numbers in (i) contain both the digits 3 and 5?

[6]

OR

- Q6)** a) A and B are members of a club with a membership of 30. In how many ways can a committee of 10 be formed if [4]
- A must be included in the committee?
 - A or B should be included but not both?
- b) In how many ways can the letters in the word “PIONEER” be arranged so that the two E’s are always together? [2]
- c) Find the number of ways a person can distribute Rs.601 as pocket money to his three sons, so that no son should receive more than the combined total of the other two. (Assume no fraction of a rupee is allowed). [6]

SECTION - II

- Q7)** a) Given a relation $R = \{(b,c), (b,e), (c,e), (d,a), (e,b), (e,c)\}$ on $A = \{a,b,c,d,e\}$. Find the transitive closure of R by Warshall’s algorithm. [6]
- b) Prove that the relation R “a – b is divisible by 7” for all a & b which are belongs to set of +ve integers is an equivalence relation. [6]

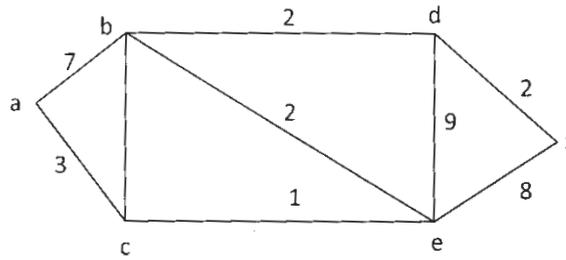
OR

- Q8)** a) Find the inverse of function $f(x) = (x + 1)/x$. [4]
- b) Let R & S be two relations on $A = \{1, 2, 3, 4\}$, $R = \{(1, 1), (1, 2), (2, 3), (2, 4), (3, 4), (4, 1), (4, 2)\}$ $S = \{(3, 1), (4, 4), (2, 3), (2, 4), (3,4), (1,1), (1,4)\}$ Compute the $R \cdot S$. [3]
- c) Draw the Hasse diagram for the relation R on $A = \{1,2,3,4,5\}$, whose relation matrix is given below: [5]

$$M_R = \begin{array}{c|ccccc} & 1 & 1 & 1 & 1 & 1 \\ \hline & 0 & 1 & 1 & 1 & 1 \\ \hline & 0 & 0 & 1 & 1 & 1 \\ \hline & 0 & 0 & 0 & 1 & 1 \\ \hline & 0 & 0 & 0 & 0 & 1 \end{array}$$

- Q9)** a) Define the following terms: [6]
- Regular graph & bipartite graph.
 - Rooted tree
 - m - ary tree
 - Full binary tree
 - Height of tree
 - Eulerian Path & Circuit

- b) Find the shortest path between the vertices a and z in the graph shown in following figure. [6]



OR

- Q10)** a) What do you mean by planar graph?
 Show that in a connected planar linear graph with 6 vertices and 12 edges, each of the region is bounded by 3 region. [6]
- b) Does K_{13} have an Eulerian circuit? A Hamiltonian circuit? [6]

- Q11)** a) For the following set of weights, construct an optimal binary prefix code. For each weight in the set give corresponding code word : [6]

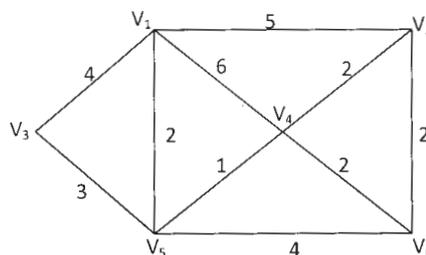
- i) 1, 2, 4, 5, 6, 9, 10, 12
 ii) 5, 7, 8, 15, 35, 40

- b) Draw the unique binary tree when inorder and preorder traversal of tree is given as follows: [5]

Inorder : Q, B, K, C, F, A, G, P, E, D, H, R
 preorder : G, B, Q, A, C, K, F, P, D, E, R, H

OR

- Q12)** a) Determine the minimum spanning tree of weighted graph G using Kruskal's algorithm. [5]



- b) Draw all full binary trees with 18 nodes. [3]
- c) A tree has $2n$ vertices of degree 1, $3n$ vertices of degree 2 and n vertices of degree 3. Determine the number of vertices and edges in the tree. [3]



Total No. of Questions : 12]

SEAT No. :

P748

[4366]-103

[Total No. of Pages : 2

F.Y.M.C.A. (Under Faculty of Engineering)
FOUNDATION OF INFORMATION TECHNOLOGY
(2008 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer any three questions from each section.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Explain following coding system with an Example : **[6]**
i) BCD
ii) EBCDIC
iii) ASCII
- b) Differentiate between the characteristics of primary and secondary storage of computers. **[6]**

OR

- Q2)** a) When is a computer said to be upward compatible with another computer? How is this feature useful for the others of these computers. **[8]**
- b) Construct a logic diagram for the boolean expression given below using only NAND gates. **[4]**
 $A.B + C.(A + B.D)$

- Q3)** a) List out the main advantages of magnetic disks as compared to magnetic tapes, as a secondary storage device. **[8]**
- b) Describe in brief printing mechanism of laser printer. **[4]**

OR

- Q4)** a) What is a CD-ROM jukebox? What are its main components? List out some typical uses of a CD-ROM jukebox. **[8]**
- b) What is meant by a family of CPUs? When do two CPUs belong to the some family. **[4]**
- Q5)** a) What are the different ways of acquiring software? List out their relative advantages & limitations. **[6]**
- b) What is a mnemonic? How is it useful in case of computer languages?**[5]**

P.T.O.

OR

- Q6)** a) What are the advantages & limitations of High level languages? [6]
b) What is firmware & what is its importance to computer system architecture? [5]

SECTION - II

- Q7)** a) What is the difference between a uni programming system and a Multi programming system? What are their relative advantages & disadvantages? [8]
b) What is a bit - mapped image ? Why is it so called? [4]

OR

- Q8)** a) Write short note on the following with reference to a spreadsheet package : [8]
i) Cell content.
ii) Range of Cells.
b) What are the typical jobs performed by the security module of an operating system. [4]
- Q9)** a) What is a database model? Name the four commonly used database models and describe any two. [8]
b) Write a short note on multimedia applications. [4]

OR

- Q10)** a) What are the operations involved in change over process? [4]
b) What is a debugger? How does it help a programmer? [4]
c) What is 'pixel'? Explain how an image is composed & displayed on computer screen? [4]
- Q11)** a) What is meant by internetworking? Explain the difference among the following terms : [6]
i) Bridge.
ii) Router.
iii) Gateway.
b) "A full duplex line is faster since it avoids the delay that occurs in a half duplex circuit". Explain. [5]

OR

- Q12)** a) Differentiate between analog and digital transmission of data. Give their advantage and disadvantages. [6]
b) Differentiate between : [5]
i) Leased line and
ii) Dial up connection.



Total No. of Questions : 12]

SEAT No. :

P749

[Total No. of Pages : 4

[4366] - 104
First Year M.C.A.
(Under Engineering Faculty)
PROBABILITY AND STATISTICS
(Semester - I) (2008 Course)

Time :3 Hours]

[Max. Marks :70

Instructions to the candidates:-

- 1) *Answers to the two sections should be written on separate answer books.*
- 2) *Figures to the right indicate full marks.*
- 3) *Use of probability table, electronic pocket calculator is allowed.*
- 4) *Assume suitable data, if necessary.*
- 5) *Neat diagrams must be drawn wherever necessary.*
- 6) *Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6, Q.7 or Q. 8, Q.9 or Q.10, Q.11 or Q.12.*

SECTION - I

- Q1)** a) Two marbles are drawn in succession from a box containing 15 blue, 20 yellow, 25 orange and 30 red marbles, with replacement being made after each drawing. Find the probability that i) both are red ii) first is blue and second is yellow iii) first is orange and second is red. **[6]**
- b) A certain firm has plants A, B and C producing 15%, 40% and 45% respectively of the total output. The probabilities of defective product from these plants are 0.25, 0.15 and 0.05 respectively. An item is selected from the total output of these plants and found to be defective. What is the probability that it is produced by plant C? **[6]**

OR

- Q2)** a) A company produces items using three different machines A, B and C. Production of these machines is 25%, 35% and 40% respectively of the total production. It is found from experience that 3%, 4% and 5% of machines A, B and C respectively are defective. On general inspection of entire production one item is selected at random and found to be defective. Find the probability that it is produced by machine B. **[6]**
- b) State and prove Baye's theorem. **[6]**

P.T.O

- Q3)** a) Define with example: [6]
- i) Two dimensional Probability function
 - ii) Sample space
 - iii) Conditional Probability
- b) If the probability that an individual suffers a bad reaction due to injection is 0.001. Determine the probability that exactly 3 out of 2000 individuals suffer a bad reaction. (Use Poisson distribution) [6]

OR

- Q4)** a) A continuous random variable has probability density function [6]

$$f(y) = \begin{cases} K(y+1), & 2 < y < 4 \\ 0 & \text{otherwise} \end{cases}$$

Find

- i) k
 - ii) $p(y < 3.2)$
 - iii) $p(2.9 < y < 3.2)$
- b) Explain the terms: [6]
- i) Independent events
 - ii) Mutually exclusive events
 - iii) Marginal probability.

- Q5)** a) Obtain mean and variance of Poisson distribution. [6]

- b) Let (X, Y) be a discrete bivariate random variable with the following p. m. f. [5]

Y	1	2	3
X			
0	3k	6k	9k
1	5k	8k	11k
2	7k	10k	13k

Find k and marginal probability mass function for X and Y.

OR

Q6) a) A joint p. d. f. of bivariate random variables X and Y is given by: [6]

$$f(x, y) = \begin{cases} c(2x + y) & \text{for } 0 < x < 2, 0 < y < 3 \\ 0 & \text{otherwise} \end{cases}$$

Find

- i) c
 - ii) $p(x >, y > 2)$
 - iii) $p(x = 2, y = 1)$
- b) Explain the following probability distributions with suitable examples : [5]
- i) Uniform Distribution
 - ii) Geometric Distribution

SECTION - II

Q7) a) What is point estimator and point estimate? What properties of estimator make it a good estimator? [6]

b) A population consists of the five numbers 2, 3, 6, 8 and 11. Consider all possible samples of size 2 that can be drawn with replacement from this population. [6]

Find:

- i) mean and standard deviation of the population
- ii) mean of the distribution of means

OR

Q8) a) Explain the following terms: [6]

- i) Confidence Interval
- ii) Random Sampling
- iii) Sample Statistics

b) Explain significance testing? How does it differ from hypothesis testing? [6]

- Q9)** a) The length of life of certain battery is approximately normally distributed with mean 300 days and standard deviation 50 days. If a random sample of 25 batteries has a life of 275 days. Test the null hypothesis that $\mu = 300$ days against the alternate hypothesis $\mu \neq 300$ days at 5% level of significance. [6]
- b) Explain the following terms: [6]
- Null hypothesis and research hypothesis.
 - Type I and type II errors.
 - Critical region for the test

OR

- Q10)** a) Write a short note on student's t-distribution. [6]
- b) The following data give the number of aircraft accidents that occurred during the various days of a week. [6]
- | | | | | | | | |
|---------------------|---|-----|-----|-----|-----|-----|-----|
| Day | : | Mon | Tue | Wed | Thu | Fri | Sat |
| Number of accidents | : | 15 | 19 | 13 | 12 | 16 | 15 |
- Test whether the accidents are uniformly distributed over the week. (Use χ^2 Test)

- Q11)** a) Explain Statistical Quality Control (SQC) with its advantages and limitations. [6]
- b) Given below are the values of sample mean \bar{X} and sample range R for 10 samples, each of size 5. Draw the appropriate mean and range charts & comment on the state of control of the process. [6]
- | | | | | | | | | | | | |
|------------|---|----|----|----|----|----|----|----|----|----|----|
| Sample No. | : | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Mean | : | 43 | 49 | 37 | 44 | 45 | 37 | 51 | 46 | 43 | 47 |
| Range | : | 5 | 6 | 5 | 7 | 7 | 4 | 8 | 6 | 4 | 6 |

OR

- Q12)** a) Write note on mean chart. [5]
- b) Explain the χ^2 test as a test of goodness of fit. Write the steps. [6]



Total No. of Questions : 12]

SEAT No. :

P750

[4366]-105

[Total No. of Pages : 2

**F.Y.M.C.A. (Engineering Faculty)
MANAGEMENT SCIENCE
(2008 Pattern) (Semester - I) (Theory)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Write answer in separate answer book.*
- 3) *Assume suitable data if necessary.*
- 4) *Figures on right indicate full marks.*
- 5) *Draw the diagram if necessary.*

SECTION - I

- Q1)** a) Define Management. Comment on a following statement :
“Management as an Art, Science and Professions”. **[8]**
b) What are the different levels of Managements? **[4]**
- OR
- Q2)** a) Explain with block diagram steps in setting up MBO. **[8]**
b) Explain planning function in details. **[4]**
- Q3)** a) Write a short note on following : **[8]**
i) E – Business Management.
ii) Enterprise Resource Planning
b) Explain role of Chambers of commerce and industries. **[4]**
- OR
- Q4)** Write a short note on following :(Any 3) **[12]**
a) Patents
b) Copyrights
c) Law of Demand
d) Law of Supply
- Q5)** a) What is Joint Stock Company? Explain characteristics, advantages and disadvantages associated with Joint Stock Companies. **[8]**
b) Draw the block diagram of matrix organization. **[3]**

P.T.O.

OR

- Q6)** a) Enumerate different forms of business organization? Explain partnership with its advantages and disadvantages. [8]
b) What are the types of partner? [3]

SECTION - II

- Q7)** a) Explain manpower planning and process of manpower planning. [8]
b) Explain media of communication. [4]

OR

- Q8)** Write a short note on following :(Any 3) [12]
a) Recruitment
b) Job Evaluation
c) Performance Appraisal
d) Mc Gregors Theory X and Theory Y
e) Factors affecting manpower planning

- Q9)** a) What is need for industrial safety? What instructions and training is essential for safety? [8]
b) Explain factory act? [4]

OR

- Q10)** a) What is noise pollution? How it is controlled? [8]
b) Explain minimum wage act in brief. [4]

- Q11)** a) Explain concept and importance of Quality Circle. [8]
b) Explain TQM in brief. [3]

OR

- Q12)** a) What is ISO 9000? Write steps involved to implement ISO 9000 in industry. [8]
b) What is the purpose of patent? Enumerate steps involved in getting a patent. [3]



Total No. of Questions : 12]

SEAT No. :

P751

[4366]-201

[Total No. of Pages : 2

F.Y. M.C.A. (Engineering Faculty) (Semester - II)

OBJECT ORIENTED PROGRAMMING

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer to the two sections should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume suitable data if necessary.*
- 4) *Section I :- Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.*
- 5) *Section II :- Q.7 or Q.8, Q.9 or Q.10, Q.11 or Q.12.*

SECTION - I

- Q1)** Explain the following **[12]**
- a) Classes and Objects.
 - b) Data Encapsulation.
 - c) Inheritance.
 - d) Polymorphism.

OR

- Q2)** a) List and explain the different types of programming techniques. And list down the limitations of procedural programming. **[6]**
- b) Explain information hiding and message passing with example. **[6]**
- Q3)** a) What is the inline function? How does the inline function differ from preprocessor macro? **[5]**
- b) Write a program to overload a function which swaps two integers data, float data and character data. **[6]**

OR

- Q4)** a) Explain argument passing to function using pointers and using reference variable. **[5]**
- b) Explain the use of NEW and DELETE operator with example. **[6]**
- Q5)** a) What is static data member and static member function? Write a program to display the total number of objects created using static data member. **[6]**
- b) Define Constructors. List and Explain different types of Constructors. **[6]**

P.T.O.

OR

- Q6)** a) Differentiate between constructors and destructors. Explain with example the implementation of array of objects. [6]
b) Give reason why class is an Abstract Data Type. Also explain 'this' pointer. [6]

SECTION - II

- Q7)** a) Write a program to overload binary '+' and '-' to add and subtract x and y co - ordinates of a point using friend function. [8]
b) List down the rules for operator overloading. [3]

OR

- Q8)** a) Write a program to overload binary '>' and '==' operators to compare to two strings. [8]
b) List down the operators that cannot be overloaded. [3]

- Q9)** a) Explain with example hybrid inheritance. [6]
b) Explain ambiguity with suitable example. How it is eliminated? [6]

OR

- Q10)** Write a short note on : [12]
a) Pure Virtual Functions.
b) Late binding.
c) Abstract base classes.

- Q11)** a) Write a program to create a class that takes Employee information (Eid, Ename, Sal etc) and stores this data in Emp. dat file. [6]
b) Explain Exception handling mechanism of C++. [6]

OR

- Q12)** a) Explain the following functions with syntax and description of all its parameters [6]
i) open ()
ii) seekg ()
iii) write ()
b) Write a C++ program to catch the divide by zero exception using exception handling mechanism. [6]



Total No. of Questions : 12]

SEAT No. :

P752

[Total No. of Pages : 3

[4366] - 202

F. Y. M.C.A. (Engineering Faculty) (Semester - II)

DATA STRUCTURES & FILES

(2008 Pattern) (Theory)

Time :3 Hours]

[Max. Marks :70

Instructions to the candidates:-

- 1) *Answer three questions from Section - I and three questions from Section - II.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What is sparse matrix? Write a pseudo code to transpose sparse matrix by using simple transpose method. [6]
- b) Write a program for polynomial addition through array. [6]

OR

- Q2)** a) What is array? Explain 2 D array with row major and column major representation. Consider an array declaration `int a[12][15]`, calculate the address of the element `int a[6][5]` in row major as well as column major with base address 1000.

(NOTE - Assume 4 byte storage for each array element) [8]

- b) Explain array list as an ADT. [4]

- Q3)** a) Write a functions to insert and delete the node from circular linked list. [8]
- b) Give the advantages of linked list implementation over array implementation. [4]

OR

P.T.O.

- Q4)** a) Write a program that represents sparse matrix (3-tuple) in terms of linked list. [8]
 b) Compare singly linked list and doubly linked list. [4]

- Q5)** a) Explain queue as a linked list. [4]
 b) Convert the following infix expression into postfix form [7]

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

and also evaluate postfix expression with following values

$$A = 25 \quad B = 54 \quad C = 3 \quad D = 3 \quad E = 2 \quad F = 45 \quad G = 7 \quad H = 2$$

OR

- Q6)** a) Explain circular queue as an array. [5]
 b) What is recursion? Write a recursive function to calculate sum of digits of number. [6]

SECTION - II

- Q7)** a) Construct binary search tree by inserting the following data sequentially. Also find height of binary search tree. [3]
 71 32 12 82 45 91 38 70 40 61
 b) What is binary tree? Explain all binary tree traversals in detail. Give inorder, preorder and postorder traversal of following binary tree. [8]

OR

- Q8)** a) What is graph? Explain with example how to represent graph statically and dynamically. [7]
 b) Define the following terms (any two): [4]
 i) Height of tree.
 ii) Complete binary tree.
 iii) Directed graph.

- Q9)** a) Sort the following list in ascending order using quick sort. Show step by step process. [6]
 44, 25, 76, 13, 67, 60, 96, 38, 98, 89
 b) Write a c program to find the desired element in an array using binary search and compute its time complexity. [6]

OR

Q10) a) What do you mean by sort stability? Explain the concept of sort efficiency. [6]

b) Compare linear search and binary search. [6]

Q11) a) Explain linear probing with suitable example. Give the drawbacks of linear probing and explain how to overcome it. [6]

b) What is hash function? Explain different methods of generating hash functions which are commonly used in various applications. [6]

OR

Q12) a) Compare sequential file access and direct file access. [6]

b) Write a short note on (any two) : [6]

i) Rehashing.

ii) Indexed sequential file organization.

iii) Open hashing.



Total No. of Questions : 12]

SEAT No. :

P760

[4366]-305

[Total No. of Pages : 2

S.Y. M.C.A. (Engineering Faculty) (Semester - III)

PRINCIPLES OF MULTIMEDIA

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidate:

- 1) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6, from section - I and Q7 or Q8, Q9 or Q10, Q11 or Q12 from section - II.*
- 2) *Answers to the two sections must be written on separate answer books.*
- 3) *Assume suitable data if necessary.*
- 4) *Draw sketches wherever necessary.*
- 5) *Figures to the right indicate full marks.*

SECTION - I

- Q1)** a) Differentiate between progressive download and real time streaming. [6]
b) Explain multimedia database system. [6]

OR

- Q2)** a) List and explain multimedia authoring tools. [6]
b) Explain characteristics of multimedia. [6]

- Q3)** a) Explain :
i) Dithering
ii) Compression [6]
b) Explain the given image file formats [6]
i) GIF
ii) JPEG

OR

- Q4)** a) Explain basic image fundamentals. What are image data types? [5]
b) Calculate the compression ratio using Shanon - Fano algorithm for the following input of given 5 symbols. [7]

Symbol	Count
A	24
B	12
C	10
D	8
E	8

P.T.O.

- Q5)** a) What are the different types of microphone based on construction? [6]
b) Explain RMF and MPEG formats. [5]

OR

- Q6)** a) Explain the various class of amplifiers. [6]
b) Write short note on [5]
i) WAV
ii) AVI

SECTION - II

- Q7)** a) Explain Huffman Coding with an example. [6]
b) Describe the various DVD formats. [6]

OR

- Q8)** a) Explain LZW algorithm. [6]
b) Describe video recording systems. [6]

- Q9)** a) Explain the concept of VR Application with respect to head mounted tracking system. [6]
b) Explain the norms of VR. [6]

OR

- Q10)** a) Explain the VR devices – Hand gloves, VR Chair. [6]
b) Explain virtual objects. [6]

- Q11)** a) Explain principles of animation. [5]
b) Explain the concepts of 3D Animation and morphing. [6]

OR

- Q12)** a) Explain the steps in creation of animation. [5]
b) Explain any two of following - [6]
i) motion cycling
ii) onion skinning
iii) 3D animation



Total No. of Questions : 12]

SEAT No. :

P762

[4366]-402

[Total No. of Pages : 3

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

WEB TECHNOLOGY

(Semester - IV) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *From Section - I, answer (Q.1 or Q.2) and (Q.3 or Q.4) and (Q.5 or Q.6).*
- 2) *From Section - II, answer (Q.7 or Q.8) and (Q.9 or Q.10) and (Q.11 or Q.12).*
- 3) *Answers to the two sections should be written in separate books.*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *Assume suitable data, if necessary.*
- 6) *Figures to the right indicate full marks.*

SECTION - I

Q1) a) Differentiate between 2 tier and 3 tier architecture with a diagram. What disadvantages of the 2 tier architecture led to the development of 3 tier architecture? [6]

b) Explain in details different types of web sites in web technology. [6]

OR

Q2) a) Explain 3 tier architecture with a suitable diagram. State its advantages and disadvantages. [6]

b) Explain in details with example 'Application of web technologies is crucial to the success of e - Commerce'. [6]

Q3) a) Write an external CSS to set the following rules and link it in a html file. Also mention whose precedence is more : internal or external style sheet. [6]

- set paragraph font size to 13 Pixel
- set paragraph text color is blue
- set h1 text color is green

b) Explain with example all core HTML attributes. [5]

OR

Q4) a) What is Scripting? What are different Scenarios to make web page Dynamic? [6]

b) Differentiate between inline and external style sheet with an example. [5]

P.T.O.

- Q5)** a) What is VBScript? Discuss the features of VB script. [6]
b) Write VBScript code for a text box to implement - null string validation, number validation and accordingly find if the input number is even or odd.[6]

OR

- Q6)** a) Write VBScript code for a text box to implement – null string validation and accordingly display the reverse of the string in the message box.[5]
b) Differentiate : [4]
i) Procedures and Functions
ii) VBScript and JavaScript
c) Explain the importance of object as data type. [3]

SECTION - II

- Q7)** a) What is DOM? What are the features of JavaScript explain in details?[6]
b) Write a user defined JavaScript function to take the birth date as input, compare it with the current date, check that the difference in dates should be more than 18 years and accordingly display an alert telling valid or invalid input. [6]

OR

- Q8)** a) Describe the click, focus, load and submit events with their attributes and tags in JavaScript. [6]
b) What is Object literal in Java Script? Explain how JavaScript objects are different from C++/JAVA objects. [6]

- Q9)** a) What is AJAX? Describe AJAX web application model? How is it different from traditional web application model? [6]
b) What is JSP? Describe various stages of JSP life cycle. [5]

OR

- Q10)** a) What is XMLHttpRequest object? Explain the working of AJAX technology. [6]
b) Write a program in JSP to print addition and subtraction of a two variables using JSP scriptlets. [5]

- Q11)** a) Compare [6]
i) ADO and ADO.NET
ii) ASP and ASP. NET

b) What is .NET Framework? Explain CLR component with suitable diagram of .NET Framework. [6]

OR

Q12) Write short notes on : [12]

- a) Connection object
- b) Data Adapter
- c) Dataset Object



Total No. of Questions : 12]

SEAT No. :

P763

[4366]-403

[Total No. of Pages : 3

S.Y.M.C.A. (Engineering Faculty) (Semester - IV)
OBJECT ORIENTED ANALYSIS AND DESIGN
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Explain the feature of UML 2.0 [5]
b) What is RUP? Explain the different phases of RUP. [6]

OR

- Q2)** a) Explain about OMG standard. [5]
b) Explain Object Oriented features with examples. [6]

- Q3)** a) Explain the tagged value concept in UML. [4]
b) Define the term of structural and behavioral diagram. [4]
c) What is UML Meta model? [4]

OR

- Q4)** a) What is the concept of OCL? [4]
b) Explain the need of Use case Diagram. [4]
c) Write a short note on “Extensibility mechanism in UML”. [4]

- Q5)** a) Explain the term Generalization and association with example. [4]
b) Draw Class diagram for a “Library Management System”. Make necessary assumptions. [8]

OR

- Q6)** a) Write a short note on CRC method. [4]

P.T.O.

- b) A customer visits the online shopping portal. A customer may buy item or just visit the page and logout. The customer can select a segment, then a category, and brand to get the different products in the desired brand. The customer can select the product for purchasing. The process can be repeated for more items. Once the customer finishes selecting the product/s the cart can be viewed if the customer wants to edit the final cart it can be done here. For final payment the customer has to login the portal, if the customer is visiting for the first time he must register with the site, else the customer must use the login page to proceed.
Draw the class diagram as per above the assumption. [8]

SECTION - II

- Q7)** a) Compare sequence and communication diagram. [6]
b) Explain different Interaction diagram with examples. [6]

OR

- Q8)** a) Draw a communication diagram for University Examination schedule for Examination management. Make suitable assumption about the scope. [6]
b) Define the concept of regions and partitions in UML. [6]

- Q9)** a) Draw the activity diagram for business process of meeting a new client as per the following assumption : [7]
- i) A salesperson calls the client and sets up an appointment.
 - ii) If the appointment is onsite (in the consulting firm's office), corporate technicians prepare conference room for a presentation.
 - iii) If the appointment is offsite (at the client's office), a consultant prepares a presentation on a laptop.
 - iv) The consultant and the salesperson meet with the client at the agreed - upon location and time.
 - v) The salesperson follows up with a letter.
 - vi) If the meeting has resulted in a statement of a problem, the consultant creates a proposal and sends it to the client.

- b) Draw state diagram for fully automated washing machine, assuming that washing machine has entire cycle of 40 minutes, of which it takes 5 minute time for soaking. Next 15 minutes for washing then 15 minutes for rinsing and last 5 minutes for spinning. [5]

OR

- Q10)** a) Explain states in state machine diagram with example. [6]

- b) Explain the concept of Timing diagram. [6]
- Q11)** a) Describe briefly the web application of UML. [5]
b) Explain the features of Component and Deployment Diagram. [6]
- OR
- Q12)** a) What is the concept Package Diagram? [5]
b) Explain the uses of UML in embedded systems. [6]



Total No. of Questions : 12]

SEAT No. :

P764

[4366]-404

[Total No. of Pages : 2

S.Y. M.C.A. (Engineering Faculty) (Semester - IV)

JAVA PROGRAMMING

(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Explain thread Synchronization with example. [6]
b) Explain Wrapper classes with example. [6]

OR

- Q2)** a) Explain hash table. Also explain method of hash table. [6]
b) Write a program to print result of addition of two integers taken from command line and handle Null Pointer Exception appropriately. [6]

- Q3)** a) What are listeners? Explain functioning of any three listener. [6]
b) Write a program to display a "Hello" message in the window when left mouse button is clicked. [6]

OR

- Q4)** a) Explain Event handling model. [6]
b) Explain Layout manager with example. [6]

- Q5)** a) Explain in details all the methods of Applet class. [6]
b) What are the different ways to view the applet? [5]

OR

- Q6)** a) Write an applet program that accepts two input string using <param> tag and concatenate the strings and display it in window. [6]
b) Write down attributes of applet tag. Explain with example. [5]

P.T.O.

SECTION - II

Q7) a) Write a program to copy the contents of one file into another file using object serialization. [6]

b) What are the various stream classes in Java? [6]

OR

Q8) a) What are the reader and writer classes available in Java? [6]

b) What is String tokenizer class? Explain in details. [6]

Q9) a) Write a program to establish a connection with a database using JDBC. [6]

b) Explain Prepared Statement in detail. [5]

OR

Q10) a) What is the use of statement class and how to retrieve data from resultSet? [6]

b) Explain different JDBC Drivers. [5]

Q11) a) What is network socket? Also give use of server socket and client socket? [6]

b) Write a program to print the InetAddress of local system. [6]

OR

Q12) a) Explain following classes with methods associated with it. [6]

i) Datagram Packet

ii) Proxy Server

b) What are the difference between TCP and UDP? [6]



Total No. of Questions : 12]

SEAT No. :

P766

[4366]-501

[Total No. of Pages : 2

T.Y. M.C.A. (Under Faculty of Engineering) (Semester - V)
PRINCIPLES AND PRACTICES FOR IT PROJECT MANAGEMENT
(2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.*
- 2) Neat diagrams should be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Explain the phases of process of management? [6]
b) What are the different managerial functions Explain in Detail? [6]

OR

- Q2)** a) What are the different steps of the staffing [6]
b) Define Business policy? What are the different techniques for strategic management? [6]

- Q3)** a) What is IT Project management? Explain IT Project management in Agriculture Sector? [6]
b) What is mean by accounting management? What are the different? Types of accounting management? [6]

OR

- Q4)** a) Discuss quality control & quality assurance. [6]
b) What is mean by Logistics? Explain in Detail with suitable example? [6]
- Q5)** a) What are the different internal and external stake holder of the project?[6]
b) What factor should be consider when organization using new technology?[5]

OR

- Q6)** a) What are the different preliminary planning are required for IT management? [6]
b) What is mean by requirement analysis? What are the different steps of requirement analysis? [5]

P.T.O.

SECTION - II

- Q7)** a) Define project schedule management plan. [6]
b) Explain how project team is organized? [6]

OR

- Q8)** a) Write a note on tracking the progress of a project. [6]
b) Write a short note on the implementation of project change. [6]

- Q9)** a) Explain how conflicts between the team members are managed during meetings. [6]
b) How a project manager should lead a team? Explain which qualities & skills are required to lead the team. [6]

OR

- Q10)** a) Explain team structure with its importance. [6]
b) What is Groups? What are the different types of groups? [6]

- Q11)** a) Explain the Six sigma and PCMM standard? [6]
b) What is mean by knowledge management? [5]

OR

- Q12)** a) What is IPR? What is mean patent and copyright? [6]
b) Explain the supply chain management in detail? [5]



Total No. of Questions : 12]

SEAT No. :

P767

[4366]-502

[Total No. of Pages : 2

T.Y.M.C.A. (Engineering Faculty)
COMPUTER GRAPHICS
(2008 Pattern) (Semester - V)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Answer Q1 or Q2, Q3 or Q4, Q5 or Q6 from Section - I & Q7 or Q8, Q9 or Q10, Q11 or Q12 from Section - II.*
- 3) *Neat diagrams should be drawn wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Explain any 3 graphics primitives. [6]
b) Explain the display file structure and how display interpreter works. [6]

OR

- Q2)** a) Explain the working of –1) Tablet & 2) Light Pen devices. [6]
b) Differentiate between the Bresenham's line drawing algorithm and DDA algorithm in 2 column format. [6]

- Q3)** a) Differentiate the 2 methods of polygon filling Seed fill and Edge fill. [6]
b) Explain the rotation about an arbitrary point. [6]

OR

- Q4)** a) Explain the Shear transformations and Reflection transformations. [6]
b) Explain inverse transforms and their application with matrix. [6]

- Q5)** a) Explain the Raster Techniques. [5]
b) Explain with figure the Mid Point Subdivision algorithm. [6]

OR

- Q6)** a) Explain the Image Transformation done using Segment table. [5]
b) Explain with figure the Interior & Exterior Clipping algorithm. [6]

P.T.O.

SECTION - II

- Q7)** a) Explain : [6]
i) Parallel projection.
ii) Perspective projection.
b) Obtain the 3D transformation matrix for rotation about an arbitrary axis. [6]

OR

- Q8)** a) Describe 3D viewing parameter. [6]
b) Write a note on 3 - dimensional transformation matrices for: [6]
i) Translation.
ii) Scaling.
iii) Rotation about X,Y,Z axis.

- Q9)** a) Explain binary space partition algorithm for hidden surfaces. [6]
b) Describe Diffuse illumination & Point - source illumination. [6]

OR

- Q10)** a) Explain Warnock's algorithm. [6]
b) Write short notes on : [6]
i) Ray tracing.
ii) Transparency.

- Q11)** a) What are the properties of Bezier curve? Describe the procedure to generate Bezier curve. [6]
b) Explain real time animation. [5]

OR

- Q12)** a) What is fractal dimension? Explain curve generation in detail. [6]
b) Explain the methods for controlling animation. [5]



Total No. of Questions : 12]

SEAT No. :

P768

[Total No. of Pages : 2

[4366] - 503

T.Y. M.C.A. (Engineering Faculty) (Semester - V)

ADVANCED DATABASE

(2008 Pattern)

Time :3 Hours]

[Max. Marks :70

Instructions to the candidates:-

- 1) *Answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6 from section I and Q.7 or Q. 8, Q.9 or Q.10, Q.11 or Q.12 from section II .*
- 2) *Answers to the two sections must be written on separate answer books.*
- 3) *Assume suitable data, if necessary.*
- 4) *Draw sketches wherever necessary.*
- 5) *Figures to the right indicate full marks.*

SECTION - I

- Q1)** a) What are the factors in estimating the performance of a query? [5]
b) Discuss the nested loop join as in join operation. [6]

OR

- Q2)** a) Let relations r_1 (A, B, C) and r_2 (C, D, E) have the following properties. r_1 has 20000 tuples, r_2 has 45000 tuples, 25 tuples of r_1 fit on one block and 30 tuples of r_2 fit on one block. Estimate the number of block accesses required using nested loop join. [6]
b) How do SQL expressions get evaluated? [5]

- Q3)** a) Explain centralized and client server database architectures. [6]
b) Explain pipelined parallelism and independent parallelism with example. [6]

OR

- Q4)** a) Explain Distributed Database with an example. [6]
b) Discuss the Transaction Server Process Structure. [6]

- Q5)** a) How does one create and access collection values in SQL? [6]
b) How does storage and access of persistent objects take place? [6]

P.T.O

OR

- Q6)** a) How are object relational features implemented? [6]
b) Explain nesting and unnesting with an example. [6]

SECTION - II

- Q7)** a) Explain with a neat diagram, the 3 tier architecture of a data warehouse. [6]
b) Explain data preprocessing and the steps involved in it. [6]

OR

- Q8)** a) What are dimension and fact tables? Explain any two multidimensional model. [6]
b) What are the steps to acquire data for data warehouse? [4]
c) What are the two types of multidimensional schema? [2]

- Q9)** a) What are the different phases in knowledge discovery? [6]
b) Write a short note on : (Any One) [3]
i) Outlier Analysis. ii) Bayesian classifiers
c) What is Text Mining? Where can text mining be made to work? [2]

OR

- Q10)** a) What is association in data mining? Explain Apriori algorithm with suitable example. [7]
b) Describe decision tree classification model. [4]

- Q11)** a) Explain the following terms related to similarity based retrieval. [6]
i) Relevance feedback ii) Homonyms
b) What is mean by Information Retrieval? What are the goals of Information Retrieval? How it is different from Database System? [6]

OR

- Q12)** a) What are the evaluation criteria for assessing Web search engines and online databases? What are the similarities and differences? [6]
b) Explain the concept of Page Rank. [4]
c) What do you mean by Ontologies? [2]



Total No. of Questions : 12]

SEAT No. :

P769

[4366]-504

[Total No. of Pages : 2

T.Y. M.C.A. (Engineering Faculty)
ENTERPRISE RESOURCE PLANNING
(2008 Pattern) (Semester - V)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Why integrated data model is considered the heart of an ERP system? Explain. [6]
b) Enlist Tangible and Non - tangible benefits of ERP system? Explain. [6]

OR

- Q2)** a) Is ERP an asset? Why? [6]
b) Explain the scope of an ERP system and business value of an ERP system. [6]

- Q3)** a) Explain Process Integration with ERP system by Example? [6]
b) Explain organizational structure of Implementation team with role? [6]

OR

- Q4)** a) What is Change management? How are the major challenges related with system. [6]
b) What is ERP? Explain ERP system Architecture with suitable example?[6]

- Q5)** a) Explain critical success factors (CSF) for ERP. What are the reasons for ERP failure. [6]
b) Which are the critical success factors for ERP implementation? What are the reason for ERP failures and their remedies? [5]

OR

- Q6)** Explain the ERP implementation Life Cycle with Phases? [11]

P.T.O.

SECTION - II

- Q7)** a) Explain the selection criteria for ERP Package? [6]
b) Discuss why it is not a good idea to develop an ERP package in - house?[6]

OR

- Q8)** a) Explain, with the help of an example, the concept of customization? [6]
b) Explain the concept of outsourcing in the context of ERP? [6]

- Q9)** a) What are the issues in Global ERP implementation? How can the E-business can be integrated with ERP? [6]
b) What is BPR? Explain role of IT in implementation in it [6]

OR

- Q10)** a) Explain Service Oriented Architecture of ERP solutions? [6]
b) Explain ERP, CRM & SCM and Data warehousing integration? [6]

- Q11)** a) Explain sales order processing and Purchasing Order management in sales & distribution Module of ERP? [6]
b) How ERP system capable of producing dramatic improvements in productivity and profitability? [5]

OR

- Q12)** a) Explain the main module of material management? [6]
b) Explain the various subsystem of Finance module of an ERP system.[5]



Total No. of Questions : 12]

SEAT No. :

P770

[Total No. of Pages : 2

[4366] - 505

Third Year M.C.A. (Engineering Faculty)

SOFTWARE TESTING

(2008 Pattern) (Semester - V) (Elective - II)

Time :3 Hours]

[Max. Marks :70

Instructions to the candidates:-

- 1) *Answer three questions from Section I and three questions from Section II.*
- 2) *Answers to the two sections should be written in separate books.*
- 3) *Neat diagrams must be drawn wherever necessary.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) What is software measurement? Explain in detail various measurement scales. [8]

b) Explain internal and external product attributes. [4]

OR

Q2) a) What is data? Explain how to collect, store and extract data. [8]

b) Give the difference between direct and indirect measurement. [4]

Q3) a) Explain in detail Halstead software science. [8]

b) Explain information flow attributes involved in software modules. [4]

OR

Q4) a) Explain object oriented metrics in detail. [8]

b) Explain Goal Question Metric paradigm. [4]

Q5) a) What are the steps involved in preparation of test plan? Explain the steps briefly. [6]

b) Describe defect life cycle. [5]

P.T.O

OR

- Q6)** a) Explain people and organizational issues in testing. [5]
b) Write short notes on : [6]
i) Error
ii) Test Case
iii) Test Suit

SECTION - II

- Q7)** a) What is structural testing? Explain code complexity testing in detail. [8]
b) Give the difference between black box testing and white box testing. [4]

OR

- Q8)** a) Explain equivalence class partitioning and boundary value analysis. [6]
b) Write short notes on : [6]
i) Validation testing
ii) Unit testing

- Q9)** a) Explain Software test automation process in detail. [8]
b) Explain what is domain testing? [4]

OR

- Q10)** a) Which are the different factors considered in performance testing? Also define load and stress testing. [8]
b) What is Specification based testing? Explain it. [4]

- Q11)** a) What are the different stages in composing the fixes? [7]
b) What are the basic steps involved in problem resolution phase? [4]

OR

- Q12)** a) Explain the different tools and repositories present in problem reporting phase. [7]
b) Explain the best practices which are followed to improve fix distribution activity. [4]



Total No. of Questions : 12]

P770

[Total No. of Pages : 3

[4366] - 505

Third Year M.C.A. (Engineering Faculty)

NEURAL NETWORK AND FUZZY LOGIC

(2008 Pattern) (Semester - V) (Elective - II)

Time :3 Hours]

[Max. Marks :70

Instructions to the candidates:-

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Explain the following in detail. **[6]**
- i) Hebbian Learning.
 - ii) Widrow-Hoff Learning.
 - iii) Stochastic Learning.
- b) What are the main differences among the three modes of artificial neuron, namely, McCulloch-Pitts, perceptron and Adaline? **[6]**

OR

- Q2)** a) Compare between Biological Neural Net and Artificial Neural Net. **[6]**
- b) What is reinforcement learning? In what way is it different from supervised learning? **[6]**
- Q3)** a) What are the advantages of multilayer perceptron over single layer perceptron. **[6]**

P.T.O

- b) Write a short note on. [6]
- i) Linear Discriminant Function.
 - ii) Define Bias, Weight, Learning Rate and Momentum Factor.

OR

- Q4)** a) How weights are adjusted with sigmoid activation function? Explain with example. [6]
- b) Explain the architecture of single layer perceptron and the training algorithm used in perceptron. [6]
- Q5)** a) Write the algorithm for Back propagation training and explain about the updation of weights. [6]
- b) Write notes on. [5]
- i) Linearly Non-separable classification problem.
 - ii) Hebb's rule.

OR

- Q6)** a) Explain the architecture and training algorithm used in Hopfield network. [6]
- b) Draw a 3-layer Feed Forward Neural Net Architecture. How we decide the number of neurons in the input and output layer for a particular application? [5]

SECTION - II

- Q7)** a) What are different fuzzy sets? Define them. [6]
- b) What are the linguistic variables? Explain linguistic variable TRUTH with examples. [6]

OR

- Q8)** a) Given $A = \{(X_1, 0.1), (X_2, 0.5), (X_3, 0.3)\}$ and $B = \{(Y_1, 0.3), (Y_2, 0.4)\}$ be the two fuzzy sets on the universes of discourse $X = (X_1, X_2, X_3)$ and $Y = (Y_1, Y_2)$ respectively. Find the Cartesian product of A and B. [6]

- b) What are the properties of Crisp set? How the shortcomings are overcome in fuzzy set representation? [6]
- Q9)** a) Discuss in brief how Fuzzy rule based model is used for function approximation. [6]
- b) Let P & Q be two fuzzy members. With suitable membership function explain the following arithmetic operations. [6]
- i) $P + Q$
 - ii) $P - Q$
 - iii) P/Q

OR

- Q10)** a) Explain Mamdani rule-based system. [6]
- b) Mention the need for the De-Fuzzification, Explain the types of De-Fuzzification with its formulae. [6]
- Q11)** a) Compare between Probability theory and possibility theory. [6]
- b) Explain min-max method of implication with a suitable example. [5]

OR

- Q12)** a) What are fuzzy implications? Discuss the criteria for fuzzy implications. [6]
- b) Explain Categorical and Qualitative reasoning in detail. [5]



Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages :2

P755

[4366] - 205

**F.Y. M.C.A. (Engineering Faculty)
MANAGEMENT INFORMATION SYSTEM
(Semester - II) (2008 Pattern)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) What are the types of IS? Explain in detail. [6]
b) Explain nature of impact of MIS on people, organization and the management. [6]

OR

- Q2)** a) What are the types of business strategies? [6]
b) "A manager's job is challenging" comment . [6]

- Q3)** a) What is material management? Explain how MIS can be used in material management. [6]
b) Difference between product management & service management. [5]

OR

- Q4)** a) What is infrastructure management? What are the different hardware and acquisition issues. [6]
b) Explain the importance of management information system in the service industry. [5]

- Q5)** a) Define enterprise management system (EMS). What are its components? [6]
b) What is BPO? Which factors decide the success of BPO industry. [6]

OR

P.T.O.

- Q6)** a) What is call center? What are different types of it? [6]
b) Explain the following terms used in the definition of BPR. [6]
i) Fundamental rethinking
ii) Radical redesign
iii) Dramatic improvement

SECTION - II

- Q7)** a) Explain B2B, B2C, C2C type of E-commerce. [6]
b) Write short note on-supply chain management (SCM). [5]

OR

- Q8)** a) Explain different electronic payment processes with example. [6]
b) Write short note on-benefits of CRM. [5]

- Q9)** a) Draw and Explain the architecture of data warehousing. [6]
b) Write a note on : [6]
i) GIS
ii) AI

OR

- Q10)** a) Differentiate between management information system and decision support system. [6]
b) Explain different types of Analytical modeling. [6]

- Q11)** a) What is Disaster recovery plan? Explain steps involved in developing disaster recovery plan. [6]
b) Explain in brief intranet and phishing. [6]

OR

- Q12)** Discuss the following issues in brief : [12]
a) Fault tolerant system
b) Firewalls
c) Global IT strategies
d) Software piracy



P753

[4366] - 203
F.Y. M.C.A. (Engineering Faculty)
OPERATIONS RESEARCH
(2008 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Answers to the two sections should be written in separate answer books.
- 2) Figures to the right indicate full marks.
- 3) Use of electronic pocket calculators is allowed.
- 4) Assume suitable data, if necessary.
- 5) All questions are compulsory.

SECTION - I**Q1) a)** Solve the following LPP by the simplex method **[10]**

$$\text{minimize : } Z = 80X_1 + 100 X_2$$

$$80X_1 + 60X_2 \geq 1500$$

$$-20X_1 + 90X_2 \geq 1200$$

$$X_1, X_2 \geq 0$$

b) Discuss the properties of LP model. **[2]**

OR

Q2) a) Find the optimum solution for the following LPP using simplex method

$$\text{maximize } Z = 8x_1 + 6x_2 + 3x_3 - 2x_4$$

$$x_1 + 2x_2 + 2x_3 + 4x_4 \leq 40$$

$$2x_1 - x_2 + x_3 + 2x_4 \leq 8$$

$$4x_1 - 2x_2 + x_3 - x_4 \leq 10$$

$$x_1, x_2, x_3, x_4 \geq 0$$

b) List the four special cases that arise in the use of simplex method. **[2]****Q3) a)** Find the optimum solution to the following transportation in which the cells contains the transportation cost in Rupees **[7]**

	W ₁	W ₂	W ₃	W ₄	W ₅	Available
F ₁	7	6	4	5	9	40
F ₂	8	5	6	7	8	30
F ₃	6	8	9	6	5	20
F ₄	5	7	7	8	6	10
Required	30	30	15	20	5	100

P.T.O.

- b) Solve the following assignment problem for maximization. [5]

	A	B	C	D	E
1	32	38	40	28	40
2	40	24	28	21	36
3	41	27	33	30	37
4	22	38	41	36	36
5	29	33	40	35	39

OR

- Q4) a) A company has received a contract to supply gravel for three new construction projects located in towns A, B, C construction engineers have estimated the required amounts of gravel which will be needed at these construction projects. [7]

Project Location	Weekly Required [Truck loads]
A	72
B	102
C	41

The company has 3 gravel pits located in towns X, Y, Z. The gravel required by the construction projects can be supplied by three pits. The amount of gravel which can be supplied by each pits is as follows

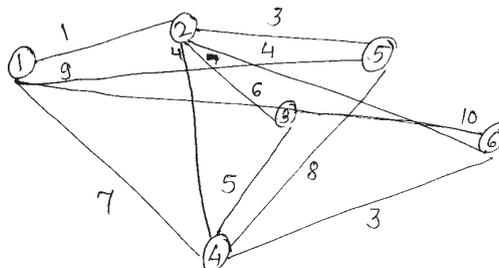
Plant	X	Y	Z
Amount Available (truck loads)	76	82	77

The company has computed the delivery cost from each pit to each project site. These costs (in Rs.) are shown in the following table :

pit	Project Location		
	A	B	C
X	4	8	8
Y	16	24	16
Z	8	16	24

- b) Explain the Transshipment model with suitable example. [5]

- Q5) a) Determine the minimal spanning tree for the given network [8]



- b) Compare PERT and CPM. [3]

OR

- Q6)** a) From the information given below construct a network diagram determine a critical path and the expected completion time of the project. Also calculate the variance of this project length. [8]

Name	Activity	Predecessor		t_o	t_m	t_p
		Name	Activity			
A	1 - 2	–	–	6	9	12
B	2 - 3	A	1 - 2	6	8	10
C	2 - 4	A	1 - 2	3	7	11
D	3 - 5	B	2 - 3	12	16	20
E	4 - 6	C	2 - 4	6	11	22
F	5 - 7	D	3 - 5	12	15	24
G	6 - 7	E	4 - 6	5	7	15
H	7 - 8	F, G	5-7, 6-7	4	8	12

- b) Compare Dijkshra's Algorithm with Floyd's Algorithm. [3]

SECTION - II

- Q7)** a) Use branch and bound techniques to solve the following integer programming problem : [7]

$$\text{Maximize } Z = 7x_1 + 9x_2$$

$$\text{Subject to } -x_1 + 3x_2 \leq 6$$

$$7x_1 + x_2 \leq 35$$

$$x_1 \geq 0, x_2 \leq 7$$

$$x_1, x_2 \text{ are integers}$$

- b) Explain any two forecasting techniques in brief. [5]

OR

- Q8)** a) Write Branch and Bound algorithm. [5]

- b) XYZ is a growth oriented firm which establishes monthly performance goals for its sales force XYZ determine that the sales force has a maximum available hours per month for visit of 640 hours.

Further it is estimated that each visit to a potential new client requires 3 hours & each visit to a current client requires 2 hours XYZ establishes two goals for the coming month. [7]

i) Contact at least 200 current clients.

ii) Contact at least 120 new clients

Over achieving either goals will not be penalized solve the GP.

Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages :2

P754

[4366] - 204

**F.Y. M.C.A. (Engineering Faculty)
MICRO PROCESSOR APPLICATIONS
(Semester - II) (2008 Pattern)**

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Assume suitable data, if necessary.*

SECTION - I

Q1) a) What are the types of buses in 8085 MPU? Explain their use in brief. **[6]**

b) Describe pin diagram of 3:8 line decoder with truth table. **[6]**

OR

Q2) a) Explain the functioning of the following pins of 8085 microprocessor. Indicate their activation status. **[8]**

- | | |
|--------------------------|--------------------------|
| i) Restart interrupt | ii) Address latch enable |
| iii) Input output/Memory | iv) READY |

b) Explain Arithmetic and logical group of 8085 microprocessor. **[4]**

Q3) a) Draw and explain the timing diagram for an instruction MVI M, data. (8-bit data) **[6]**

b) Write an ALP to load register B with 60H and register C with 27H and add the two place the final result in D register. **[6]**

OR

Q4) a) Explain the execution of the following instructions with example. **[6]**

- | | | |
|----------------|-----------|--------------|
| i) LDA address | ii) ADD M | iii) MOV M,R |
|----------------|-----------|--------------|

b) Calculate the sum of series of numbers. The length of the series is in memory location 4200H and the series begins from memory location 4201H. **[6]**

P.T.O.

- Q5)** a) Explain mode 0 of 8255 PPI. [4]
b) Explain the PPI 8255 with functional block diagram of in detail. [7]

OR

- Q6)** a) Write short note on. [5]
i) BSR mode ii) I/O mode
b) Explain the I/O interfacing techniques of 8085 MPU. [6]

SECTION - II

- Q7)** a) Give details of hardware interrupt and software interrupt of 8085. [6]
b) Explain functional block diagram of 8253 with neat diagram. [6]

OR

- Q8)** a) Draw and explain the pin diagram of 8253. [6]
b) What do you mean by interrupt? What is ISR? What is the function of ISR. [6]

- Q9)** a) Draw and explain block diagram of 8086. [8]
b) What is memory segmentation? What are advantages of memory segmentation? [4]

OR

- Q10)** a) Explain various registers in 8086. [6]
b) What is 8086 microprocessor? Explain features of 8086 microprocessor. [6]

- Q11)** a) Write 8086 assembly language program to add array of N numbers stored in the memory. [7]
b) Explain what is meant by BIOS calls. List and use of any 4 BIOS call. [4]

OR

- Q12)** a) Write 8086 ALP to add two hexadecimal numbers. [7]
b) Explain BIOS call INT 11h in detail. List and use of each DOS call. [4]



Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages :3

P756

[4366] - 301

S.Y. M.C.A. (Under Engineering)

OPERATING SYSTEMS

(Semester - III) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Differentiate between lexical analysis and syntax analysis. [6]
b) Explain Language Processing Development Tool (LPDT). Give example of LPDT. [6]

OR

- Q2)** a) Explain function performed by following Assembler Directive (Any Three) [6]
i) START
ii) END
iii) ORIGIN
iv) EQU
v) LTORG
b) Why Variation are given for Intermediate Code (IC) in Assembler? Differentiate between Variant I and Variant II. [6]

- Q3)** a) Explain the following loader scheme : [6]
i) Absolute loader
ii) Relocating loader.
b) Write a short note on MS DOS Linker. [6]

P.T.O.

OR

- Q4)** a) Define terms : [6]
i) Bootstrap compiler.
ii) Cross Compiler.
b) List various phases of compiler. Explain optimization in detail with example. [6]

- Q5)** a) Write short note on : [6]
i) Batch Processing systems.
ii) Time sharing systems.
b) Explain Process Control Block (PCB). [5]

OR

- Q6)** a) Assume that we have workload shown. All five processes arrive at time 0, in the order given, with the length of CPU burst time given in milliseconds : [6]

Process	Burst Time
P1	10
P2	29
P3	3
P4	7
P5	12

- Consider the FCFS, SJF and Round Robin (quantum = 10 ms) scheduling algorithms for these processes. Which algorithm would give the minimum average waiting time.
- b) Enlist the services provided by operating system. Discuss the structure used to design O.S? [5]

SECTION - II

- Q7)** a) Write short note on : [6]
i) Virtual memory management.
ii) Swapping
iii) Paging
b) Differentiate between internal and external fragmentation. [6]

OR

- Q8)** a) Compare and contrast contiguous and non contiguous memory allocation. [6]
b) Explain optimal page replacement and LRU page replacement algorithms. [6]
- Q9)** a) Explain two level and tree structured directory. [6]
b) Explain the concept of file protection. What are the different access rights given to a file? [6]

OR

- Q10)** a) Consider a disk with 200 cylinders. The disk queue with requests for I/O to blocks on cylinders occur in the following sequence :
98, 183, 37, 122, 14, 124, 65, 67
Assuming that the head is at cylinder 53, what is the total distance that disk arm moves to satisfy all the pending requests for the following disk scheduling algorithms : [6]
i) FCFS
ii) SCAN
b) Differentiate between Linked allocation and Index allocation of disk space. [6]
- Q11)** a) Explain the following with respect to Linux system : [6]
i) Fork system call
ii) Exec system call
iii) Exit system call
b) Explain any three components of a Linux system. [5]

OR

- Q12)** a) Comment on process scheduling in Linux. Which algorithms are used in Linux for scheduling? [6]
b) Explain features of Linux Operating System. [5]



Total No. of Questions : 12]

SEAT No. :

[Total No. of Pages :3

P757

[4366] - 302

S.Y. M.C.A. (Under Engineering Faculty)

DATABASES : CONCEPTS AND SYSTEMS

(Semester - III) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *All questions are compulsory.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data, if necessary.*

SECTION - I

- Q1)** a) Describe Relational Data model, Hierarchical Data model and Network Data model. **[6]**
b) Write advantages and disadvantages of DBMS approach. **[5]**

OR

- Q2)** a) Describe Query Processor and Storage Manager Components of DBMS. **[6]**
b) What is DDL and DML? Give one example of each. **[5]**
- Q3)** a) Construct an ER diagram for a car insurance company whose customers own one or more cars each. Each has associated with it zero to any number of recorded accidents. **[4]**
b) Explain with an example how ER diagram is converted into table. **[8]**

OR

- Q4)** a) Give the significance of following design constraints. **[8]**
i) User - Defined ii) Condition - Defined
iii) Disjoint iv) Overlapping
b) Define Weak Entity set, strong entity set, attribute, stored and derived attributes, and composite attributes? **[4]**

P.T.O.

- Q5)** a) What is a view? Explain insert, update and delete operations with respect to views. [6]
b) What is integrity and referential constraints. Explain. [6]

OR

- Q6)** a) Write a note on index types? What are the advantages and disadvantages of indexes. [7]
b) Explain different types of joins in SQL with suitable example. [5]

SECTION - II

- Q7)** a) Consider the employees database for the following schema. [8]
Employee(employee _name, street, city)
Works(employee _ name,company _name,salary)
Company(company_name, city)
Manages(employee _name,manager _name)
Give an expression in Sql for each of the following queries.
i) Find the names and cities of residence of all employees who work for First Bank Corporation.
ii) Find the names, street addresses, and cities of residence of all employees who work for First Bank corporation and earn more than \$10000.
iii) Find all employees in the database who do not work for First Bank Corporation.
iv) Find the Company that has the most employees.
b) Explain Embedded and Dynamic SQL. [4]

OR

- Q8)** a) Explain any four aggregate functions in SQL with suitable examples.[4]
b) Write a short note on Triggers and stored procedure. [8]
- Q9)** a) What is meant by functional dependencies. Explain 2NF, 3NF with example. [7]
b) Explain Database design methodology. [5]

OR

Q10) a) Given the relation schemas $R=(A,B,C,D,E)$ and functional dependencies as [7]

$A \rightarrow C, C \rightarrow D, CE \rightarrow A, B \rightarrow c, DE \rightarrow C.$

Relations R are decomposed into lossy or lossless? Justify.

b) Write short note on multi valued dependency. [5]

Q11) a) Define Serializability. Explain the types of serializability with example. [6]

b) Explain Deadlock Handling with example. [5]

OR

Q12) a) Explain Recoverability with example. [6]

b) Explain shadow paging method as a crash recovery method. [5]

