Total No. of Questions :12]

SEAT No. :

P3683

[Total No. of Pages :3

[4961]-11

F.Y.M.C.A. (Faculty of Engineering)

PROBLEM SOLVING AND PROGRAMMING IN C

(2008 Pattern) (Semester - I) (510901)

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

Instructions to the candidates:

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 should be written in separate answer 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) Explain the concept of program verification with suitable example. **[6]**

b) Devise an algorithm to convert given binary number to its decimal integer. **[6]**

OR

Q2) a) What constraints should be considered for efficiency of algorithms? **[6]**

b) Write a program to calculate the sum of every 7^{th} numbers beginning with i=5 (i.e. 5+12+19+.....n). Accept the value of n from user. **[6]**

Q3) a) Explain scope & life time of variable. **[6]**

b) Explain any three string library functions used in C with basic syntax & suitable example. **[6]**

OR

P.T.O.

Q4) a) Define iteration and recursion. Mention the difference between them with an example. **[6]**

b) Write Notes on the following: **[6]**

i) External variables & scope of variables.

ii) Static & register variables.

Q5) a) What is array? Explain the difference between the character array & int array. **[6]**

b) Write a program to accept 10 numbers from user, store them into an array & display all the even numbers that are present at odd index. **[5]**

OR

Q6) a) What is multidimensional array? Explain 2-dimensional & 3-dimensional array with example. **[6]**

b) Write a program to accept a string from user into an array & display all the vowels present in it. **[5]**

SECTION -II

Q7) a) Write a C program to test whether the input no. is perfect or not. **[6]**

b) Write a C program using pointers to accept two matrices from the user and perform addition of given matrices. **[6]**

OR

Q8) a) i) Differentiate between calloc( ) and malloc( ) function in C. **[6]**

ii) Explain the purpose of each of the following declarations

1) int *p[10];

2) char *p[10];

b) Write a C program using pointers to read an array of integers and prints its elements in descending order. **[6]**

Q9) a) Distinguish between Array and structure. **[6]**

b) Write a C program to find maximum value from given two integers using macro with parameters. **[6]**

OR

Q10)a) What is the use of "typedef"? Explain with example. **[6]**

b) Define a macro to compute area of circle. Write a program using this macro to compute the area of circle. **[6]**

Q11)a) Write a difference between w+and a+ file mode. **[4]**

b) Write a C program to count number of spaces, number of lines and number of characters in a given text file. **[7]**

OR

Q12)a) Write a short note on function prototype. **[4]**

b) Write a program to accept two file name using command line and copy the content of one file into another file. **[7]**

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Total No. of Questions :12]

SEAT No. :

P3684

[Total No. of Pages :5

[4961]-12

First Year M.C.A. (Under Engineering Faculty)

DISCRETE MATHEMATICS

(2008 Course) (Semester - I) (510902)

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

Instructions to the candidates:

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 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) Show by mathematical induction, that for all $n \geq 1$,

$1 + 2 + 3 + ... + n = n(n+1)/2$. **[6]**

b) Verify that if A & B are finite sets, then $|A \cup B| = |A| + |B| - |A \cap B|$. **[6]**

OR

Q2) Out of a total of 130 students, 60 are wearing hats to class, 51 are wearing scarves, and 30 are wearing both hats and scarves. Of the 54 students who wearing sweaters, 26 are wearing hats, 21 are wearing scarves, and 12 are wearing both hats and scarves. Everyone wearing neither a hat nor a scarf is wearing gloves. **[12]**

a) How many students are wearing gloves?

b) How many students not wearing a sweater are wearing hats but not scarves?

c) How many students not wearing a sweater are wearing neither a hat nor a scarf?

P.T.O.

Q3) a) 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]**

b) Construct a truth table for the following **[6]**

$(\neg(P \wedge Q) \vee \neg R) \vee (((\neg P \wedge Q) \vee \neg R) \wedge S)$

OR

Q4) a) Demonstrate that R V S follows logically from the premises **[5]**

$C \vee D, (C \vee D) \rightarrow \neg H, \neg H \rightarrow (A \wedge \neg B)$, and $(A \wedge \neg B) \rightarrow (R \vee S)$.

b) Rewrite the following statements using quantifier variables and predicate symbols. **[7]**

i) All birds can fly.

ii) Not all birds can fly.

iii) Some men are genius.

iv) Some numbers are not rational.

v) There is a student who likes mathematics but not geography.

vi) Each integer is either even or odd.

vii) All prime numbers are not odd.

Q5) a) Find the no of distinguishable permutations of the letters in the following:**[6]**

i) MALAYALAM

ii) MISISSIPPI

b) How many symbol codes can be formed if the first two symbols are letters and the next three are digits, but no symbol repeated? **[5]**

OR

Q6) a) An eight member committee is to be formed from a group of 10 men and 15 women. In how many ways can be committee be chosen if- **[6]**

The committee must contain 4 men & 4 women.

b) Compute the following: **[5]**

i) $_{20}C_8$

ii) $_{25}C_7$

SECTION -II

Q7) a) Given a relation R = {(1, 2), (2, 3), (3, 4), (2, 1)} on A = {1, 2, 3, 4}. Find the transitive closure of R by Warshall's algorithm. **[6]**

b) On the set of integers, the relation R is defined by "aRb" if and only if "(a-b) is even integer". Show that R is an equivalence relation. **[6]**

OR

Q8) a) Function f, g, h are defined on a set X = {1, 2, 3} as f = { (1, 2), (2, 3), (3, 1)} g = {(1, 2), (2, 1), (3, 3)}, h = { (1, 1), (2, 2), (3, 1)} find f o g, g o f, f o g o h, f o h o g. **[6]**

b) Given a relation R = {(4, 3), (2, 2), (2, 1), (3, 1), (1, 3)}. Find the transitive closure of R by Warshall's algorithm. **[6]**

Q9) a) Define the following terms: **[6]**

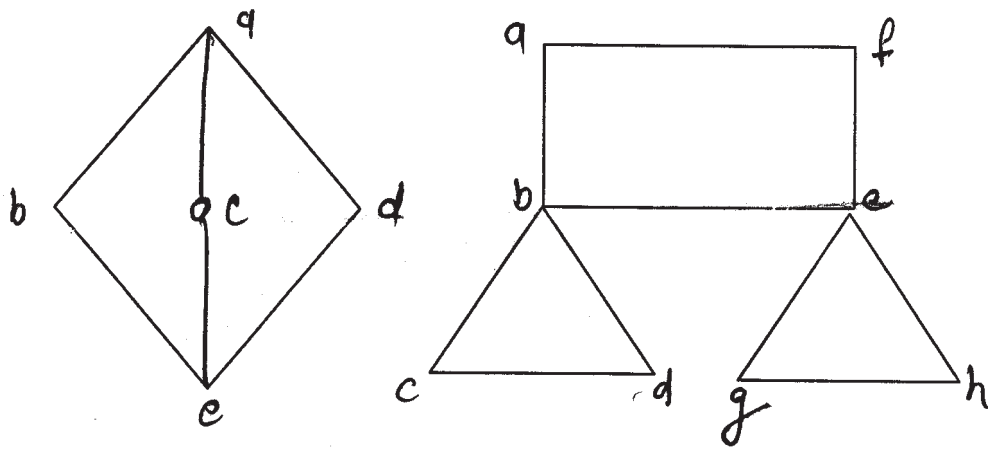
i) Graph

ii) Bipartite Graph

iii) Multigraph

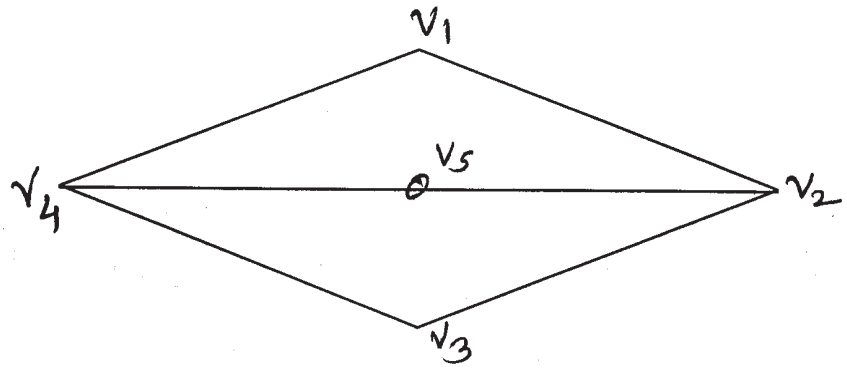
iv) Regular Graph

b) Determine whether the Eulerian path & circuit exists in the graph. **[6]**



OR

Q10)a) Is the following graph contains Hamiltonian circuit? If yes, find the Hamiltonian circuit. **[6]**



b) Determine the number of regions defined by a connected graph with 10 nodes and 15 edges. Draw the graph. **[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) 8, 9, 10, 11, 13, 15, 22

ii) 5, 7, 8, 15, 35, 40

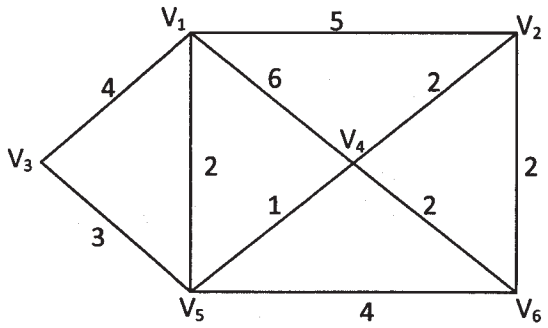
b) Draw the unique binary tree when preorder and postorder traversal of tree is given as follows: **[5]**

preorder : * + a – b c / d e - + f g h

postorder: a b c - + d e - f g + h - / *

OR

Q12)a) Determine the minimum spanning tree of weighted graph G using Prim's algorithm. **[6]**



b) Draw full binary trees with 17 nodes. **[5]**

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Total No. of Questions : 12]

SEAT No. :

P3685

[Total No. of Pages : 3

[4961]-13

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

FOUNDATION OF INFORMATION TECHNOLOGY

(2008 Course) (510903) (Semester - I)

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

Instructions to the candidates:

1) ***Answers to the two sections should be written in separete answer books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

SECTION - I

Q1) a) Construct logic circuit diagram for following expression using AND/ OR/NOT gates. **[4]**

(A + B.C) + (A*B-C). (A + D)

b) Explain All the Computer codes in details. **[8]**

OR

Q2) a) Explain the characteristics of computer. **[4]**

b) Find decimal equivalent of following. **[4]**

i) $(95.07)_2$

ii) $(541.49)_{16}$

c) What is the client server architecture? **[4]**

Q3) a) Compare: **[8]**

i) RISC & CISC

ii) Sequential and Direct access memory.

b) What is Flat Panel monitor? Where is it commonly used? **[4]**

OR

Q4) a) Explain the printing mechanism of laser printer. **[4]**

b) What are the applications of magnetic disk. **[4]**

c) List out the main function of CPU. **[4]**

Q5) a) Compare: **[6]**

i) Interpreter and compiler.

ii) Natural language and high computer language.

b) What is mnemonic? How is it useful in case of computer languages? **[5]**

OR

Q6) a) What are the advantage & limitation of high level language? **[6]**

b) Hardware & software of a computer system are like two sides of coins. Discuss. **[5]**

SECTION - II

Q7) a) What is virtual memory? Explain the basic concept used for realization of virtual memory? **[8]**

b) What are the main functions of an Operating System? **[4]**

OR

Q8) a) Write a short note on the following: **[6]**

i) Response Time.

ii) Turnaround Time.

iii) Throughput.

b) What is meant by text, graphics & image importing facility in word-processing package? How is it useful? **[6]**

Q9) a) What is program bug? What is debugging? **[4]**

b) What is file management system? **[4]**

c) What is Documentation? Explain different forms of documentation. **[4]**

OR

Q10)a) What is database model? Name the four commonly used database model & describe any three. **[8]**

b) What is transducer? Name two devices that can be categorized as a transducer. **[4]**

Q11)a) Differentiate between analog & digital transmission of data. Give their advantage & disadvantage. **[7]**

b) Describe some of the typical uses of internet. **[4]**

OR

Q12)a) Describe the two basic methods of multiplexing. Give use of both the methods. **[7]**

b) What is File Transfer Protocol? **[4]**

Total No. of Questions :12]

SEAT No. :

P3686

[Total No. of Pages :3

[4961]-14

First Year M.C.A. (Under Engineering Faculty)

PROBABILITY AND STATISTICS

(2008 Course) (Semester -I)

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

Instructions to candidates:

1) ***Answer to the two sections should be written in separate answer books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks***
4) ***Use of probability table, electronic packet calculator is allowed.***
5) ***Assume suitable data, if necessary.***

SECTION -I

Q1) a) State and prove Baye's theorem. **[6]**

b) A certain firm has plants A, B and C producing 25%,25% and 50% respectively of the total output. The probabilities of non-defective product from these plants are 0.70,0.80 and 0.85 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 box contains 10 black, 15 blue, 20 orange and 25 yellow balls Two balls are drawn from a box at random. Find the probability that. **[6]**

i) Both are blue.

ii) First is orange and second is blue.

iii) First is black and second is yellow.

b) What are the Axioms of probability? Illustrate with example. **[6]**

P.T.O.

Q3) a) Define with example: **[6]**

i) Probability Mass Function.

ii) Sample Space.

iii) Marginal Probability.

b) Write note on Poisson Distribution. **[6]**

OR

Q4) a) Explain the terms: **[6]**

i) Independent Events.

ii) Mutually Exclusive Events

iii) Conditional probability.

b) A random variable has the following probability mass function. **[6]**

x	-2	-1	0	1	2	3
p(x)	0.1	k	0.2	2k	0.3	3k

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

Q5) a) Write note on Binomial Distribution. **[5]**

b) Obtain mean of Poisson Distribution. **[6]**

OR

Q6) a) A joint p.d.f. of random variable X is given by: **[6]**

$$f(x)=\begin{cases} c(x-1) & \text{for } 1<x<4 \\ 0 & \text{otherwise} \end{cases}$$

Find i) k ii) $f(2<x<4)$

b) Write note on Uniform Distribution. **[5]**

SECTION- II

Q7) a) What is point estimator and point estimate? Write properties of estimator. **[5]**

b) Write note on **[6]**

i) Sampling with replacement.

ii) Sampling without replacement

OR

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

i) Confidence Interval.

ii) Central Limit Theorem.

iii) Methods of Moments.

b) Explain significance testing? How does it differ from hypothesis testing? **[5]**

Q9) a) What is maximum likelihood estimation? Explain the method to obtain maximum likelihood estimate. **[6]**

b) Explain the following terms: **[6]**

i) Null hypothesis and research hypothesis.

ii) Type I and type II errors.

iii) Critical region for the test.

OR

Q10)a) Write note on student's t-distribution. **[6]**

b) Explain χ^2 distribution with its applications. **[6]**

Q11)a) Explain Statistical Quality Control (SQC) with its applications. **[6]**

b) Write step to draw Mean chart. **[6]**

OR

Q12)a) Explain the $\chi 2$ test as a test of goodness of fit. Write the steps **[6]**

b) Write step to draw p chart. **[6]**

Total No. of Questions :12]

SEAT No. :

P3687

[Total No. of Pages :3

[4961] - 15

F. Y. M.C.A. (Faculty of Engineering)

MANAGEMENT SCIENCE

(Semester - I) (2008 Course) (510905) (Theory)

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 diagrms must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) Describe Contributions of F.W. Taylor and Henry Fayol in management. **[8]**

b) Define management. Explain different functions of management. **[4]**

OR

Q2) a) Mention any four administrative concepts of effective management and discuss two of them in brief. **[8]**

b) Explain the benefits of change management in details. **[4]**

Q3) Write a short note on following:

a) Scales of production. **[6]**

b) Price, Value and Utility. **[6]**

OR

P.T.O.

Q4) Write a short note on following: **[12]**

a) Copyrights.

b) Trademarks.

Q5) a) What is Joint Stock Company? Explain characteristics, advantages and disadvantages associated with Joint Stock Companies. **[8]**

b) Draw the block diagram of Project structures. **[3]**

OR

Q6) a) State and explain MOA and AOA. **[8]**

b) What are different types of co - operative sectors? **[3]**

SECTION - II

Q7) a) Explain Mc Gregors Theory X and theory Y. **[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) Factors affecting manpower planning

Q9) a) What is needed for industrial safety? What instructions and training is essential for safety? **[8]**

b) Explain minimum wage act in brief. **[4]**

OR

Q10) a) What is noise pollution? How it is controlled? **[8]**

b) Explain factory act? **[4]**

Q11) a) What is ISO 9000? Write steps involved to implement ISO 9000 in industry. **[8]**

b) Explain TQM in brief. **[3]**

OR

Q12) a) Explain concept and importance of Quality Circle. **[4]**

b) What is the purpose of patent? Enumerate steps involved in getting a patent. **[7]**

Total No. of Questions : 12]

SEAT No. :

P3688

[Total No. of Pages : 2

[4961]-21
F.Y.M.C.A.(Engg.)
OBJECT ORIENTED PROGRAMMING
(2008 Course) (Semester-II)(510909)

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

Instructions to the candidates:

1) ***Answer to the two sections should be writtern 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) a) Compare Object Oriented Programming and Procedural Programming? **[6]**

b) Explain Polymorphism in brief. **[6]**

OR

Q2) a) Define Objects? How data and functions are organized in an object oriented program? **[6]**

b) List the advantages of OOP technology. **[6]**

Q3) a) What is function overloading? Explain with example. **[6]**

b) Explain cin and cout in detail. **[6]**

OR

Q4) a) Write a sort note on new and delete operators. **[6]**

b) Write a program to show the use of I/O manipulators. **[6]**

Q5) a) Differentiate between Destructors and Constructors. **[6]**

b) Justify “Class is a Abstract Data Type”. **[5]**

OR

P.T.O.

Q6) a) Write a short note on Friend Function. **[6]**

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

SECTION-II

Q7) a) What is operator overloading? Why it is necessary to overload an operator? **[6]**

b) Explain operator overloading with friend function. List which operators can't be overloaded. **[6]**

OR

Q8) a) What is difference between unary and binary operator overloading? **[6]**

b) Write a program to overload '*' operator to multiply two matrices using friend function. **[6]**

Q9) a) Explain with example multilevel inheritance. **[6]**

b) What is the difference between early binding and late binding? Explain with examples. **[6]**

OR

Q10) a) Write a short note on Types of Inheritance. **[6]**

b) How inheritance implements reusability in C++? Give examples of each types of inheritance. **[6]**

Q11) a) Explain with example the fill(),setf() and unsetf() functions. **[6]**

b) Write a short note on Exception Handling inc++ **[5]**

OR

Q12) a) Explain the following functions with syntax and description of all its parameters.

i) put ( ) ii) seekg ( ) iii) get( ) **[6]**

b) Explain how while(fin) statement detects end of file that is connected to fin stream. **[5]**

Total No. of Questions : 12]

SEAT No. :

P3689

[Total No. of Pages : 3

[4961]-22

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

DATA STRUCTURE AND FILES

(2008Course) (Semester-II) (510910)(Theory)

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

Instructions to the candidates:

1) ***Answer Q.1 or Q.2,Q.3or 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 should be written in separtate 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 is array? Write a memory representation of Array? **[5]**

b) Consider integer array int a [30] [40] declared in C program. If the base address is 1000, find the address of the element a [27] [38] with the row major representation. **[5]**

c) Define the following with example: **[2]**

i) ADT ii) Data object

OR

Q2) a) Write a C program for the addition of two polynomial. **[6]**

b) Compare Linked representation with sequential representation **[6]**

Q3) a) Write a pseudo C code for the insertion of an element in linked list.**[6]**

b) Discuss deletion of an element in the singly linked list.(Give pictorial Representation) **[6]**

OR

P.T.O.

Q4) a) Represent addition of following two polynomials in the form of a linked list. Clearly show the node structure used for each polynomial **[6]**

i) $P(x) = x^3 - 5x^2 - 10$ & $Q(x) = 4x^2 + 7x$

ii) $P(x) = 2.2x^4 - 8.1x^2 + 5.6$ & $Q(x) = 3x^3 + 10x + 30$

b) Write a pseudo C code for the insertion of an element in Circular linked list. **[6]**

Q5) a) Convert the following infix expression into postfix expression by showing the content of stack for every iteration: **[5]**

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

b) Write an ADT for STACK. Write a program for STACK using array in C **[6]**

OR

Q6) a) What is QUEUE? Write an algorithm for operation on QUEUE. **[6]**

b) Write a note on recursion; Also write an algorithm for factorial of a number using recursion **[5]**

SECTION-II

Q7) a) Write a recursive procedure for the following traversal of binary tree: **[6]**

i) Postorder ii) Inorder

b) Construct a binary search tree from the following: **[6]**

14, 10, 17, 12, 20, 11, 8, 25, 1822, 30, 23, 7, 13

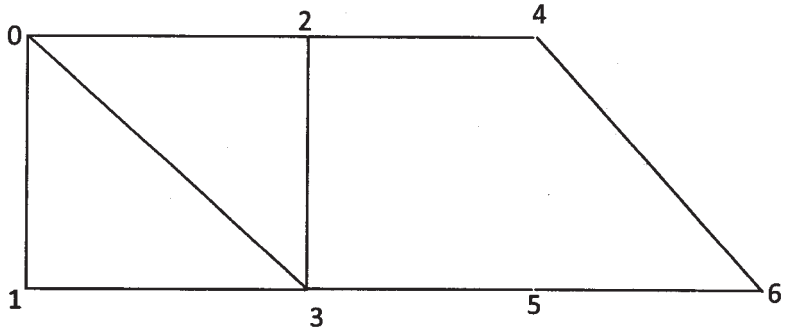
OR

Q8) a) Define the following: **[4]**

i) Graph ii) Multigraph

iii) Loop iv) Connected graph

b) Using following graph construct the Adjacency Matrix, Adjacency List, Breadth First Search(BFS) and Depth First Search(DFS): **[8]**



Consider starting point as "A"

Q9) a) Write the best, average and worst case complexity of Quick Sort. **[4]**

b) Write a pseudo 'C' routine to sort the follwoing numbers using quick sort. Show all the passes to sort the values in ascending order: **[8]**

40, 20, 10, 80, 60, 50, 7, 30, 100.

OR

Q10) a) Write a C code for selection sort and calculate its complexity **[6]**

b) Define the following: **[6]**

i) Sort order

ii) Sort stability

iii) Sort Efficiency and Sort passes

Q11) a) What is hashing? What are the characteristics of a good hash function? **[6]**

b) Explain sequential access file. **[5]**

OR

Q12) What do you mean by collision resolution? Explain linear probing with example. **[11]**

Total No. of Questions : 12]

SEAT No. :

P3690

[Total No. of Pages : 5

[4961]-23

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

OPERATION RESEARCH

(2008 Course) (Semester - II) (510911)

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) ***Figures to the right side indicate full marks.***
4) ***Use of probability, table electronic pocket Calculator is allowed.***
5) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) Solve the given LPP by Simplex Method **[8]**

Maximize $z = 10x_1+15x_2+20x_3$

Subject To $2x_1+4x_2+6x_3<=24$

$3x_1+9x_2+6x_3<=30$

$x_1, x_2, x_3>=0$ ans -100

b) Explain the primal-dual relationship. **[4]**

OR

Q2) a) Discuss Two-phase method for solving an LPP. **[8]**

b) A nutrition scheme for babies is proposed by a committee of doctors. Babies can be given two types of food (I and II) which are available in standard sized packets weighing 50 grams. The cost per packet of these foods are Rs.2 and Rs. 3 respectively. The vitamin availability in each type of food per packet and the minimum vitamin requirement for each type of vitamin are summarized in below table. Develop a linear programming model to determine the optimal combination of food types with the minimum cost such that the minimum requirement of vitamin in each type is satisfied **[4]**

P.T.O.

Vitamin availability per packet			
Vitamin	Food type I	Food Type II	Minimum daily required vitamin
1	1	1	6
2	7	1	14
Cost/packet (Rs)	2	3	

Q3) a) In a firm there are 4 salesmen availble to 4 counters. Each salesman can handle any counter. The service of each counter which managed by each salesman is given below. How should the salesman be allocated to appropriate counters so as to minimize the service time? Each salesman must handle only one counter. Also indicate the total service time. **[7]**

*	Salesman			
	A	B	C	D
W	41	72	39	52
X	22	39	49	65
Y	27	49	60	51
Z	45	50	48	52

b) Write a short note on Modified distribution method [MODI] **[4]**

OR

Q4) a) A computer centre has got 4 expert programmers. The centre needs 4 programs to be developed. The head of the computer centre after carefully studying the program estimated the time in minutes required by respective experts programmers as follows **[7]**

Experts	Programmers			
	A	B	C	D
1	120	100	80	90
2	80	90	110	70
3	110	140	120	100
4	90	90	80	90

Solve the above assignment problem to allot maximum experts to programmers.

b) Write the steps of NWCM. **[4]**

Q5) a) Write the steps of Floyd's Algorithm. **[6]**

b) Explain following terms **[6]**

i) Forward and backward pass

ii) Dummy Activity

OR

Q6) a) Form the information given below draw network diagram, determine critical path and compute total floats and free floats **[8]**

Activity	Immediate predecessors(s)	Duration(Months)
A	-	2
B	-	6
C	-	4
D	B	3
E	A	6
F	A	8
G	B	3
H	C,D	7
I	C,D	2
J	E	5
K	F,G,H	4
L	F,G,H	3
M	I	13
N	J,K	7

b) Write differences between PERT and CPM. **[4]**

SECTION - II

Q7) a) List various forecasting techniques. Explain anyone technique in detail. **[6]**

b) Discuss the advantages and disadvantages of solving Linear Integer programming problems by

i) Cutting plane method

ii) branch and bound method. **[6]**

OR

Q8) a) Discuss the advantages and disadvantages of solving Linear integer programming problems by

i) Cutting plane method **[6]**

ii) branch and bound method.

b) Fit a straight line trend for the following time series using least square method. **[6]**

Estimate the no. of production units for the year 2001

Year	1994	1995	1996	1997	1998	1999	2000
No. of Prod^{n} units.	125	128	133	135	140	141	143

Q9) a) Explain Utility Function for risk. **[4]**

b) Following is the payoff table: **[8]**

Strategy	Sales of nature		
	N1	N2	N3
	Inflation	Recession	No change
A	2000	1200	1500
B	3000	800	1000
C	2500	1000	1800

Which strategy should be chosen on the basis of

i) Pessimistic

ii) Optimistic

iii) Equally likely (Laplace)

iv) Regret Criterion

OR

Q10)a) What is EMV? Explain steps for calculating EMV. **[4]**

b) Explain decision making under certainty using AHP. **[8]**

Q11)a) Define simulations. Explain Merits and Demerits of Simulation Technique. **[4]**

b) Write short note on: **[7]**

i) Monte Carlo simulation

ii) Pseudo-random numbers

OR

Q12)a) Explain the three common most methods of collecting observations in simulation. **[4]**

b) Generate 7 random numbers based on multiplicative congruently method using b = 17, c = 111, m = 103, seed = 7. **[7]**

Total No. of Questions : 12]

SEAT No. :

P3691

[Total No. of Pages : 3

[4961]-24
F.Y.M.C.A. (Engg.)
MICROPROCESSOR APPLICATIONS
(2008 Course) (Semester - II) (510912)

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) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) Explain the Functional block diagram of 8085 with suitable diagram. **[8]**

b) Discuss following Concepts: **[4]**

i) Tri-state logic

ii) Latches

OR

Q2) a) What is address decoding? What are the essentials of Memory Interfacing? **[6]**

b) Explain the purpose of ALE. **[6]**

Q3) a) What is Instruction? Discuss with an Example addressing modes of 8085. **[8]**

b) Write a short note on Assembler Directives. **[4]**

OR

P.T.O.

Q4) a) Draw & Explain the timing diagram of OUT Instruction. **[8]**

b) Explain flag registers of 8085. **[4]**

Q5) a) Explain control word format for I/O mode & BSR mode of 8255 PPI. **[6]**

b) Discuss decoder logic of I/O interface using latch. **[5]**

OR

Q6) a) Explain input or output with handshake mode of 8255 PPI. **[6]**

b) What are the advantages and disadvantages of Programmed I/O. **[5]**

SECTION - II

Q7) a) Explain Vectored interrupts in 8085. **[6]**

b) Discuss pending interrupt in 8085. **[6]**

OR

Q8) a) Explain the architecture of 8253 with neat diagram. **[6]**

b) Explain with neat diagram control word of 8253. **[6]**

Q9) a) List & Explain all the registers of 8086. **[6]**

b) Explain Minimum mode operation of 8086. **[6]**

OR

Q10)a) Draw and explain the programmer's model of 8086. **[6]**

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

Q11)a) Explain architecture of 8086 with neat diagram. **[5]**

b) List & explain the DOS calls for accepting the character (s) through keypad. **[6]**

OR

Q12)a) Write an 8086 assembly language program to reverse 5 numbers in an array. **[5]**

b) Explain how 20 bit physical address is generated in 8086. **[6]**

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Total No. of Questions : 12]

SEAT No. :

P3692

[Total No. of Pages :3

[4961]-25
F.Y.M.C.A - Engg.
MANAGEMENT INFORMATION SYSTEMS
(2008 Course) (Semester - II) (Theory) (510913)

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) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

SECTION - I

Q1) a) Explain the Importance of Information systems. **[6]**

b) Explain Hardware and software management in MIS. **[6]**

OR

Q2) a) State and explain various roles of a manager. **[6]**

b) What are the types of Business Strategies? **[6]**

Q3) a) Discuss the role of MIS in managing a hospital. **[6]**

b) Explain the importance of Management Information System in the service industry. **[6]**

OR

Q4) a) Explain the application of management Information System (MIS) in Payroll Systems. **[6]**

b) Explain how MIS can be employed in material department of manufacturing firm. **[6]**

P.T.O.

Q5) a) State the functions of call center. Explain the types of training required for call center employees. **[6]**

b) Define Enterprise Management System (EMS)? What are its components? **[5]**

OR

Q6) a) What is BPO? Which factors decide the success of BPO Industry? **[6]**

b) How to implement Enterprise Resource Planning? **[5]**

SECTION - II

Q7) a) What is computer crime? Explain various Internet abuses in the workplace? **[6]**

b) Write short note on Supply Chain Management (SCM). **[6]**

OR

Q8) a) Explain the scope of e-commerce. State the potential benefits of e-commerce. **[6]**

b) Write short note on:

i) Cyber theft

ii) CRM **[6]**

Q9) a) Write a short note on Knowledge based System. **[6]**

b) Write short notes on (Any 2): **[6]**

i) Data warehousing

ii) Data mining

iii) Different tracking techniques.

OR

Q10)a) What is Decision support system? Explain four basic types of Analytical modeling activities. **[6]**

b) Write a short note on Expert Systems. **[6]**

Q11)a) List and briefly explain the issues involved in global management of IT. **[5]**

b) Explain Biometric security and elaborate on fault tolerant systems. **[6]**

OR

Q12)a) Explain following aspects of security management: **[6]**

i) Encryption

ii) Fire walls

iii) Email monitoring

b) What are the Geo economical challenges? **[5]**

Total No. of Questions :12]

SEAT No. :

P3693

[Total No. of Pages :4

[4961]-31
S.Y.M.C.A. (Engg.)
OPERATING SYSTEM
(2008 Course) (Semester - III) (610901)

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

Instructions to the candidates:

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 should be written in separate answer 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) How does a programmer decide to use macro calls or procedure calls? Justify your answer from the view point of **[6]**

i) A programmer

ii) The CPU

b) Describe a basic techniques for comparative assembly. **[6]**

OR

Q2) a) Explain with suitable example, what features of assembly language makes it mandatory to design a two pass assembler? **[6]**

b) Differentiate between lexical analysis and syntax analysis. **[4]**

c) What is a single pass assembler? **[2]**

P.T.O.

Q3) a) List out the advantages and disadvantages of absolute loader. **[6]**

b) Explain the uses of Linkers, Loaders and compilers. **[6]**

OR

Q4) a) What is an object module? What information does the object module contain? **[6]**

b) Discuss the loader schemes. **[4]**

c) Define MS-DOS Linker. **[2]**

Q5) a) Name any three operating system structures. Give one advantage of each give one disadvantages of each. **[7]**

b) Consider the following set of processes, with the length of the CPU-burst time given in milliseconds: **[4]**

Process	Burst Time	Priority
P1	10	3
P2	1	1
P3	2	3
P4	1	4
P5	5	2

The processes are assumed to have arrived in the order P1, P2, P3, P4, P5, all at time 0. Draw four *Gantt charts* illustrating the execution of these processes using FCFS, SJF, a non-preemptive priority (a smaller priority number implies a higher priority), and RR(quantum = 1) scheduling.

OR

Q6) a) Explain the difference between preemptive and non-preemptive scheduling. **[5]**

b) What are the main functions of an operating system? **[4]**

c) What is Process? **[2]**

SECTION -II

Q7) a) Consider page reference string as 5, 4, 3, 2, 1, 4, 3, 5, 4, 3, 2, 1, 5. Number of page frames is four. Show the page replacement and calculate number of page faults for the following page replacement algorithms. **[8]**

i) FIFO

ii) Optimal page replacement

b) What is difference between paging and segmentation? **[4]**

OR

Q8) a) What is Swapping? Explain how space is allocated using swapping. **[6]**

b) Explain the address allocation in virtual memory. **[6]**

Q9) a) Explain the concept of file protection. What are the different accesses rights given to a file? **[6]**

b) Explain two level and tree structured directory. **[6]**

OR

Q10)a) Suppose that a disk drive has 100 cylinders, numbered 0 to 99. The drive is currently serving a request at cylinder 26, and the previous request was at cylinder 16. The queue of pending requests, in FIFO order, is 37, 100, 14, 88, 33, 99 and 12. For each of the following disk scheduling algorithms, answer these **[6]**

Questions:

i) What is the order in which the pending requests are processed?

ii) Starting from the current head position, what is the total distance (in cylinders) that the disk arm moves to satisfy all the pending requests?

1) FCFS 2) SSTF

b) List the contents of file directory entry. **[6]**

Q11)a) Explain the user, kernel, and hardware interface of linux operating system. **[6]**

b) Explain Inode assignment to new file. **[5]**

OR

Q12)a) Explain the various data structure used by Linux file sub system and how it supports the implementation of various file system functionalities. **[8]**

b) What are different process states? **[3]**

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Total No. of Questions : 12]

SEAT No. :

P3694

[Total No. of Pages : 2

[4961]-32
S.Y. M.C.A. (Engineering)
DATABASES CONCEPTS AND SYSTEMS
(2008 Pattern) (Semester - III) (610902)

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) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

SECTION - I

Q1) a) What is database? Explain three schema architecture of database. **[6]**

b) Explain the difference between physical and logical data indepedence. **[5]**

OR

Q2) a) Define the term data model. Explain relational data models and network data model. **[6]**

b) Explain data abstraction in database system with suitable example. **[5]**

Q3) a) Explain the different constraints on specialization/generalization with suitable example. **[6]**

b) Explain in detail stored and derived attributes and composite attributes. **[6]**

OR

Q4) a) Draw the E-R diagram for the university system which includes information about students, department, professors, courses, which student are enrolled in which course, which professor are teaching in which courses, student grades, which courses a department offers. Consider suitable assumption wherever required. **[6]**

b) Explain strong entity set and weak entity set with example. **[6]**

Q5) a) List and explain codd's rule in detail. **[6]**

b) What is constraint? Explain primary key and foreign key, **[6]**

OR

P.T.O.

Q6) a) What is a view? Explain how to create non updatable view with example. **[6]**

b) Explain index and sequence with example. **[6]**

SECTION - II

Q7) a) What is cursor? Explain explicit cursor with %rowcount, %isopen. **[6]**

b) What is trigger? Explain statement level trigger and row level trigger with example. **[6]**

OR

Q8) a) Explain inner join and outer join with example. **[6]**

b) Explain embedded sql. **[6]**

Q9) a) Explain in detail functional dependency. **[6]**

b) What is normalization? Explain in detail first, second normal form. **[6]**

OR

Q10)a) Describe the concept of full functional dependency and describe how this concept relates to 2NF. **[6]**

b) Consider relation **[6]**

R(orderno, orderdate, itemno, itemname, quantity, unitprice).

i) Is this , relation is in 2NF? If not, why?

ii) Normalize the relations to 2NF and 3NF.

Q11)a) Describe Deadlock with suitable example and also explain about recovery from the deadlock. **[6]**

b) What is transaction? Explain ACID properties of transaction with example. **[5]**

OR

Q12)a) Explain in details logs based recovery technique. **[6]**

b) What is lock? What are the various types of locks used for concurrency control? **[5]**

Total No. of Questions :12]

SEAT No. :

P3695

[Total No. of Pages :3

[4961]-33

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

FINANCIAL ACCOUNTING AND MANAGEMENT

(2008 Pattern) (Semester - III) (610903)

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

Instructions to the candidates:

1) ***Answer any three questions from each section***
2) ***Answer 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 the accounting Principles and Conventions? **[6]**

b) What are objectives of financial statements? **[6]**

OR

Q2) a) Journalize the following transaction: **[8]**

1) Shriram started business with cash Rs 75000.
2) Purchase goods for cash Rs.10000.
3) Sold goods for cash Rs.7000.
4) Purchase machinery from M/s Hiralal bro. for cash Rs.9200.
8) Sold goods to Madhuri Rs.4200 on credit.
15) Paid rent Rs.5500.
17) Received cash from Madhuri Rs.4200.
20) Bought goods from Sudhakar Rs.3000 on credit

b) Write notes on Trial Balance? **[4]**

P.T.O.

Q3) a) Differentiate between variable overhead cost and fixed overhead cost. **[6]**

b) Explain the various financial ratios? **[6]**

OR

Q4) a) From the following information relating to XYZ Pvt. Ltd, calculate the break-even point and the turnover

required to earn a profit of Rs.1,20,00/-

Fixed overhead Rs.84,00/-

Variable Overhead Rs.8 per unit.

Selling price Rs.20/- per unit.

If the company is earning a profit of Rs.1,20,00/- what is the margin of safety available to it? **[8]**

b) Write note on Cash budget? **[4]**

Q5) a) Elaborate the following factors affecting the requirements of working capital: **[8]**

a) Nature of business.

b) Business fluctuations.

c) Operating cycle.

d) Economies of scale.

b) Discuss the working capital policy in brief. **[3]**

OR

Q6) a) What is Working Capital? Explain the importance of working capital and types of working capital? **[8]**

b) What are current assets? How do they differ from fixed assets? **[3]**

SECTION- II

Q7) a) Explain different limitations of capital budgeting? **[6]**

b) Explain the process of Capital budgeting for any project? **[6]**

OR

Q8) Write short notes: (Any three) **[12]**

a) Payback period.

b) Concept of Future value.

c) Concept of capital expenditure.

d) Internal rate of return.

Q9) a) What are the various approaches to the estimate of overall cost of capital? Explain in brief? **[6]**

b) A share holder purchased a share of Rs.100/-. for 5 years he received dividend at the rate of 10% per year. At the end of 5 years, he sold his share for Rs.550/- what is his rate of return? **[6]**

OR

Q10)a) What is cost of capital? Why should a financial manager know the cost of capital of his firm? **[6]**

b) A company has issued 20 year bonds of Rs.1000/-face value at Rs.900/- each Rate of interest is 10% and the tax rate for the company is 52%. The company has taxable profit. What is the cost of bond capital. **[6]**

Q11)a) How the different services of Tally 9.0 is useful to a finance manager? **[6]**

b) What are the Advantages and Disadvantages of computerized accounting system? **[5]**

OR

Q12)Explain following with suitable example: **[11]**

a) Features and significance of it in accounting.

b) How tally useful for debit and credit purpose.

Total No. of Questions :12]

SEAT No. :

P3696

[Total No. of Pages :3

[4961] - 34

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

COMPUTER COMMUNICATIONS & NETWORKS

(2008 Course) (610904)

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 diagrms must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

SECTION - I

Q1) What is Computer/ data communication? Explain basic model of communication with neat diagram. **[11]**

OR

Q2) a) Explain any two unguided media in detail. **[6]**

b) State types of transmission mode. Explain any transmission mode in detail. **[5]**

Q3) Explain in detail **[12]**

a) Connectors

b) Bridges

c) Switches

d) Repeaters

OR

P.T.O.

Q4) a) Explain service provided by data link layer in detail. **[6]**

b) Explain OSI model with their protocols. **[6]**

Q5) State types of media access protocol. Explain any two in detail. **[12]**

OR

Q6) Write short note on **[12]**

a) ALOHA

b) CSMA/CD

SECTION - II

Q7) Write short note on **[12]**

a) Quality of Service

b) Firewall

c) Internetworking

OR

Q8) a) Describe in detail virtual Circuit and Datagram Subnet. **[6]**

b) Describe IP protocol in detail. **[6]**

Q9) a) What is socket? Explain various socket primitives used in client server interaction. **[6]**

b) Explain difference between TCP & UDP. **[6]**

OR

Q10) a) Explain how TCP provides flow control mechanism. **[6]**

b) What is silly window syndrome? How to overcome it? **[6]**

Q11) a) What is FTP? Where & when it is used? Why does it require 2 ports? **[5]**

b) Explain Email Architecture with different Scenarios. **[6]**

OR

Q12) a) Explain the working of HTTP. **[5]**

b) Explain DNS Servers. **[6]**

Total No. of Questions : 12]

SEAT No. :

P3697

[Total No. of Pages : 2

[4961]-35
SY.M.C.A.(Engg)
PRINCIPLES OF MULTIMEDIA
(2008 Coures)

Time :3Hours] *[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) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

SECTION-I

Q1) a) State and explain various characteristics of multimedia presentation. **[6]**

b) Explain storage and retrieval of multimedia data. List any two MM databases. **[6]**

OR

Q2) a) What is Multimedia Authoring? What are the functions of Multimedia Authoring Software? What are it's different types? **[6]**

b) What is streaming technology? How it is useful in multimedia application development? **[6]**

Q3) a) Explain GIF and JPEG file format in detail. **[6]**

b) What is the difference between compression rate and compression ratio? Explain any one lossless compression technique with the help of suitable example. **[6]**

OR

Q4) a) What is image enhancement? How image enhancement is done using point processing? **[6]**

P.T.O.

b) Explain Run Length Encoding compression technique with example. **[6]**

Q5) a) List different elements of Audio system. Explain various types of amplifiers. **[6]**

b) Describe the audio file format supported by windows operating system. **[5]**

OR

Q6) a) Explain CD-DA technology, discuss the limitations and advantages of the same. **[6]**

b) Explain psychoacoustics in detail. **[5]**

SECTION-II

Q7) a) Compress the string 'XYXYYYXYZZXYYX' using LZW compression technique Calculate the compression ratio. **[6]**

b) Compare different video transmission standards. **[5]**

OR

Q8) a) Explain Huffman coding algorithm with example. **[6]**

b) Explain text file formats in brief. **[5]**

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

b) What is VRML? What are its design criteria? What are its characteristics? **[6]**

OR

Q10) a) Define virtual reality. Explain different forms of virtual reality. **[6]**

b) Write a short note on VR applications **[6]**

Q11) a) Describe different tools to create animation. **[6]**

b) Explain the principles of animation with an example **[6]**

OR

Q12) a) What do you mean by animation on web? Explain client pull animation by example. **[6]**

b) What is rendering? Explain the terms interpolation and motion paths with respect to animation. **[6]**

Total No. of Questions : 12]

SEAT No. :

P3698

[Total No. of Pages : 3

[4961]-41
S.Y.M.C.A.(Engg)
SOFTWARE ENGINEERING
(2008 Pattern) (Semester-IV)(610909)

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

Instructions to the candidates:

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

SECTION-I

Q1) a) What is software engineering? Explain generic process framework activities in software development. **[6]**

b) What is RAD process model? Give the advantages of RAD model over the other process model. **[6]**

OR

Q2) a) What is process pattern? Explain need of process assessment in software engineering. How process assessment can be achieved through different standard approaches? **[8]**

b) Explain the need of personal and team process model in software engineering. **[4]**

Q3) a) What is computer based system? Explain different elements of computer based system. **[7]**

b) Explain how to map generic framework activities in the essence of software engineering practices. **[5]**

OR

P.T.O.

Q4) a) Describe "system engineering hierarchy". Explain how system modeling plays vital role in system engineering. **[6]**

b) Explain various communication practices which are need to be followed in software engineering. **[6]**

Q5) a) What is requirement engineering? Explain the steps that require to initiating requirement engineering process. **[6]**

b) Draw swim lane diagram for college library system which includes. **[5]**

-Student registers themselves with their details at library

-Librarian issues books to student,

-Student verification, and updation of student details also done by librarian

-User and roles management

OR

Q6) a) What is requirement analysis? State and explain how requirement analysis model works as a bridge between system description and design model.**[7]**

b) Draw the use case diagram for above mentioned college library system.**[4]**

SECTION-II

Q7) a) How to evaluate user interface design? Explain design evaluation steps in detail. **[6]**

b) What is the need of software architecture? Explain architectural design in detail. **[6]**

OR

Q8) a) What is pattern based software design? Explain different views through which pattern based software design is implanted. **[6]**

b) How to translate analysis model into design model in design engineering? **[6]**

Q9) a) Explain smoke testing in detail.Give their advantages in testing. **[7]**

b) Give the difference between verification and validation. **[4]**

OR

Q10) a) What is white box testing? Explain control structure testing. **[5]**

b) What is fault based testing? Give the limitations of fault based testing and also explain how to overcome it. **[6]**

Q11)a) Explain Goal- Question-Metric paradigm. **[5]**

b) Explain Albrecht's function point metric in analysis model. **[7]**

OR

Q12)a) What is software quality? Explain in detail different factors that are contributed in software quality. **[7]**

b) Write a short note on: "Metric for Object oriented design". **[5]**

Total No. of Questions : 12]

SEAT No. :

P3699

[Total No. of Pages : 3

[4961]-42

SY.M.C.A.(UnderEngineeringFaculty)

WEB TECHNOLOGY

(2008 Course) (Semester-IV)

Time :3Hours] *[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) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data if necessary.***

SECTION-I

Q1) a) Explain 3-tier architecture in detail with suitable diagram. **[6]**

b) What is e-commerce? Explain different applications of e-commerce examples. **[5]**

OR

Q2) a) Explain GET and POST methods in detail with suitable example. **[5]**

b) Explain FTP in detail with neat diagram. **[6]**

Q3) a) Create a static HTML page that displays the following output using table: **[6]**

Product Details		
Product Type	Product No.	Product Name
Electrical Appliance	1001	Iron
Kitchen Appliance	1002	Toaster
Kitchen Appliance	1003	Oven
Computer Accessory	2001	Printer
Computer Accessory	2002	Scanner

P.T.O.

b) Explain following CSS properties with suitable example. **[6]**

i) font

ii) z - index

iii) background

OR

Q4) a) What is CSS? Explain external CSS with suitable example? **[6]**

b) Explain the following tags in brief with their attributes: **[6]**

i) div

ii) ul

iii) table

Q5) a) Write the main differences between **[6]**

i) If...else and select case in VBScript.

ii) VBSCript and JavaScript

b) Explain any two loop statements in VBScript with suitable example. **[6]**

OR

Q6) a) Write a function in VBScript to calculate area of circle. Accept radius from user. **[6]**

b) Write string and date functions in VBScript. **[6]**

SECTION-II

Q7) a) Create an html page that accepts the registration detail from user such as name, address, phone number and email address. Validate the details using JavaScript. **[6]**

b) Explain any four events in JavaScript in brief. **[6]**

OR

Q8) a) Write a program to accept user id and password in JavaScript. Display welcome message if user name and password are correct or invalid user if not correct. **[6]**

b) Explain document object model in JavaScript with suitable diagram. **[6]**

Q9) a) What is JSP? Explain JSP Life cycle with suitable diagram. What are advantages of JSP over servlet? **[6]**

b) Write JavaScript code to find out maximum of three numbers(All three numbers should be accepted from user and display the maximum among them in new text box on click of "Find Max" button) **[6]**

OR

Q10) a) What is AJAX? Explain the working of AJAX model in detail. **[6]**

b) Write a program in JSP to accept user information in html form and display the accepted contents in the browser window. **[6]**

Q11) a) Explain the server controls in ASP.Net. **[6]**

b) Explain the "onreadystatechange event of AJAX model". **[5]**

OR

Q12) a) Explain the .Net framework. Explain how it is platform independent. **[5]**

b) Explain all validation controls in ASP.Net in brief. **[6]**

Total No. of Questions : 12]

SEAT No. :

P3700

[Total No. of Pages : 3

[4961]-43

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

OBJECT ORIENTED ANALYSIS AND DESIGN

(2008 Course) (Semester - IV) (610911)

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

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Use of probability table, electronic pocket calculator is allowed.***
4) ***Assume suitable data if necessary.***

SECTION - I

Q1) a) Explain the design view in 4 + 1 view architecture. **[5]**

b) Explain CORBA architecture. **[6]**

OR

Q2) a) Explain in brief new features of UML 2.0. **[5]**

b) Explain iterative architectural approach. **[6]**

Q3) a) Write note on: **[6]**

i) UML profiles

ii) Need of class diagram

b) What is "Extensibility mechanism in UML"? Explain with example. **[6]**

OR

Q4) a) Which are the various structural diagrams in UML 2.0? Explain role of each diagram in brief. **[6]**

b) Explain the benefits of using UML. **[6]**

P.T.O.

Q5) a) Draw use case diagram for ATM system. Make necessary assumptions. **[6]**

b) Explain with example association, generalization and aggregation. **[6]**

OR

Q6) a) Draw Class diagram for a "Hotel Management System". Make necessary assumptions. **[7]**

b) Explain CRC method with example. **[5]**

SECTION - II

Q7) a) Draw interaction overview diagram for vending machine. Make suitable assumptions. **[7]**

b) Write note on Interaction occurrences. **[4]**

OR

Q8) a) Draw sequence diagram for withdrawing money from ATM machine. Make suitable assumption. **[7]**

b) Explain with example communication diagram. **[4]**

Q9) a) Draw state machine diagram for digital watch. Write your assumptions clearly. **[6]**

b) Explain fork and Join with example. **[6]**

OR

Q10)a) Draw timing diagram for washing machine. Write suitable assumption. **[6]**

b) Write note on: Partitions and regions. **[6]**

Q11)a) Explain Deployment diagram with example. **[6]**

b) Draw component diagram for "Online Airline Reservation System." **[6]**

OR

Q12)a) What is the use of package diagram? Explain with example. **[6]**

b) Describe UML web applications. **[6]**

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Total No. of Questions : 12]

SEAT No. :

P3701

[Total No. of Pages : 2

[4961]-44
S.Y.M.C.A.
HUMAN COMPUTER INTERFACE
(2008 Course) (610913) (Semester - IV)

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

Instructions to the candidates:

1) ***Answers to the two sections should be written in separte answer books.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

SECTION - I

Q1) a) What is reasoning? Explain different type of reasoning with example? **[6]**

b) What are the human factors that are to be considered while designing the user interface? Explain with the help of suitable examples? **[6]**

OR

Q2) a) Describe four differences between short Term Memory and Long Term Memory. What do you mean by Direct Pointing Devices? **[6]**

b) Explain following terms related to the human short - term memory. **[6]**

i) Digit Span

ii) Chunking

Q3) a) Explain 8 golden rules of ID. **[6]**

b) Explain HCI Patterns with examples. **[6]**

OR

Q4) a) Explain guidelines for data entry and data display? **[6]**

b) Explain BNF and Task Action Grammar in brief. **[6]**

Q5) a) State and explain Three pillers of inter face design process? **[6]**

b) Explain how scenarios help in the design process of interactive system. **[5]**

OR

P.T.O.

Q6) a) What is Participatory design? Explain with suitable examples. **[6]**

b) What is interaction design process? Explain. **[5]**

SECTION - II

Q7) a) Write a note on Expert reviews. **[6]**

b) Explain different menu styles with example. **[6]**

OR

Q8) a) What are different issues while designing multiple design windows for applications? **[6]**

b) Explain the "item representation sequence". **[6]**

Q9) a) Explain O-AI Model for website designing. **[6]**

b) Explain the concept of Groupware with the help of example. **[6]**

OR

Q10)a) What are the requirements for printed manual (documentation) of software? **[6]**

b) Explain the following CSCW systems are useful for co-operative working

i) Meeting Rooms.

ii) Shared Drawing Surface. **[6]**

Q11)a) Explain Social Acceptability of web based systems. **[5]**

b) Write a short note on: Multimedia Document Searches. **[6]**

OR

Q12)a) Give three benefits and three problems of touch screen as a device. **[5]**

b) Consider a social networking site and discuss any three good any three bad features of it. **[6]**

Total No. of Questions : 12]

SEAT No. :

P3702

[Total No. of Pages : 2

[4961]-45
S.Y.M.C.A. Engg.
ORGANIZATIONAL BEHAVIOR
(2008 Course) (610913) (Elective - I) (Semester - IV)

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) ***Figures to the right side indicate full marks.***
4) ***Assume Suitable data if necessary.***

SECTION - I

Q1) a) What is perception? Explain factors influencing perception. **[6]**

b) Explain Goal setting and Reward system. **[6]**

OR

Q2) a) Explain primary and secondary motives with suitable example. **[6]**

b) Write a note on competency. **[6]**

Q3) a) Does motivation come from within a person or is it a result of the situation. **[6]**

b) Define Stress? What are the Sources of stress? **[6]**

OR

Q4) a) Explain Maslow's theory of hierarchy of needs. **[6]**

b) Do you think competition and conflict are different? Explain. **[6]**

Q5) a) Explain how to handle levels of conflicts in an organization? **[6]**

b) Define the term Group Dynamics and discuss its importance. **[5]**

OR

Q6) a) How are opportunities, constraints, and demands related to stress? Give an example of each. **[6]**

b) Explain factors influencing Human resource Planning in organization. **[5]**

P.T.O.

SECTION - II

Q7) a) Explain the various organizational Structures in detail. **[6]**

b) Define Leadership and explain importance of leadership to the organization. **[6]**

OR

Q8) a) Write a short note on Organization Culture. **[6]**

b) Write a short note on Hersey & Blanchard's theory of leadership. **[6]**

Q9) a) Write short notes on: **[6]**

i) Constructive conflicts.

ii) Destructive conflicts.

b) What is relation of re-engineering with empowerment? **[6]**

OR

Q10)a) Write short note on: **[6]**

i) Resistance to change

ii) Response to change

b) Compare traditional Vs Modern view of conflict. **[6]**

Q11)a) Explain Learning organization. **[5]**

b) Write short note on : **[6]**

i) Benchmarking

ii) Downsizing

OR

Q12)Explain various aspects of quality? What is Total Quality Management? What are the benefits of TOM? **[11]**

Total No. of Questions : 12]

SEAT No. :

P3703

[Total No. of Pages :2

[4961]-46
S.Y.M.C.A.(Engineering)
JAVA PROGRAMMING
(2008 Course) (610912)

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

Instructions to the candidates:

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

SECTION-I

Q1) a) Explain how interfaces are implemented in java. **[6]**

b) What are packages? Explain how to create a package. **[6]**

OR

Q2) a) List and explain the features of java? **[6]**

b) Explain the use of try,catch throw and finally keyword. **[6]**

Q3) a) Explain the flow Layout in detail with example. **[6]**

b) Write a java code to create a bouncing ball application **[6]**

OR

Q4) a) Write a short note on JMenu **[6]**

b) Compare and contrast AWT and Swing. **[6]**

Q5) a) Write an applet to display a smiley face. **[6]**

b) How will you play an audio using applet? **[5]**

OR

Q6) a) Explain the life cycle of an applet in detail. **[6]**

b) List and explain the various attributes of <APPLET>tag. **[5]**

P.T.O.

SECTION-II

Q7) a) List and explain various input stream classes in java **[6]**

b) What is serialization and how it is implemented in java. **[6]**

OR

Q8) a) Explain the various types of error that are encountered while file stream handling? How they are handled? **[6]**

b) Write a short note on Random Access File. **[6]**

Q9) a) What is JDBC? Explain its role in Application development. **[6]**

b) Explain the various JDBC drivers. **[6]**

OR

Q10)a) Write a program which display content of a table form MS access Database and display it. **[6]**

b) Explain transaction management. **[6]**

Q11)a) Explain the constructors and function of Server Socket class. **[6]**

b) Write how TCP is implemented in java. **[5]**

OR

Q12)a) Write a program to create an echo server. **[6]**

b) What is internet addressing? Explain Inet Address class. **[5]**

Total No. of Questions :12]

SEAT No. :

P3704

[Total No. of Pages :2

[4961]-51
T.Y.M.C.A. (Engg.)
PRINCIPLES AND PRACTICES FOR IT PROJECT MANAGEMENT
(2008 Pattern) (Semester - V) (710901)

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

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right side indicate full marks.***
3) ***Use of probability table, electronic pocket calculator is allowed.***
4) ***Assume suitable data if necessary.***

SECTION -I

Q1) a) Discuss importance of management. **[6]**

b) Explain different business ethics in any organization. **[6]**

OR

Q2) a) Explain different roles played by managers. **[6]**

b) Explain tools and techniques of strategic management. **[6]**

Q3) What are applications of IT in banking sector? Explain with example. **[12]**

OR

Q4) What are applications of IT in insurance sector? Explain with example. **[12]**

Q5) a) What are the risks associated with Project identification and classification? **[6]**

b) Explain work breakdown structure. **[5]**

OR

P.T.O.

Q6) a) Define project goals by identifying the project needs. **[5]**

b) Explain level of conflicts and how to manage it. **[6]**

SECTION -II

Q7) a) Explain constraints to define project schedule. **[6]**

b) Explain issues involved in managing team. **[6]**

OR

Q8) a) Explain resource procurement. **[6]**

b) What is need of revision of project plan? **[6]**

Q9) a) Explain in detail formal technical reviews. **[6]**

b) Write note on stress management. **[6]**

OR

Q10)a) Explain employee welfare process. **[6]**

b) Write note on: Team bonding. **[6]**

Q11)a) Write note on knowledge management. **[6]**

b) What is impact of IT quality management system. **[5]**

OR

Q12)a) Write note on Six Sigma. **[5]**

b) Explain Intellectual Property Rights. **[6]**

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Total No. of Questions : 12]

SEAT No. :

P3705

[Total No. of Pages : 3

[4961]-52
T.Y.M.C.A. (Engg.)
COMPUTER GRAPHICS
(2008 Course) (710902) (Semester - V)

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

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume Suitable data if necessary.***

SECTION - I

Q1) a) Write Short note on **[6]**

i) Display File Interpreter,

ii) Raster Scan Display.

b) Explain Graphics primitives for the following devices: **[6]**

i) Tablet,

ii) Touch panels.

OR

Q2) a) Using mid-point circle drawing algorithm, find out which pixels would be turned on for the circle whose radius is 4 and whose center co-ordinates are (0, 0). **[6]**

b) Explain Bresenham's line drawing algorithm and compare the advantages of it over DDA Algorithm. **[6]**

Q3) a) Explain inverse transformation and derive the matrix for inverse transformation. **[6]**

b) Compare the following polygon filling algorithms: **[6]**

i) Seed fill, ii) Edge Fill

OR

P.T.O.

Q4) a) Describe with respect to 2D transformation: **[6]**

i) Translation

ii) Rotation

iii) Scaling.

b) Explain the different methods for testing the pixel inside the polygon. **[6]**

Q5) a) Discuss the structure of segment table and explain any two segments operations. **[6]**

b) Explain text clipping techniques in detail. **[5]**

OR

Q6) a) Explain viewing transformation. **[6]**

b) Explain 2D midpoint subdivision algorithm for line clipping. **[6]**

SECTION - II

Q7) a) Explain the concept of parallel and perspective projections. **[6]**

b) Describe with respect to 3D transformation : **[6]**

i) Translation

ii) Rotation

iii) Scaling

OR

Q8) a) Explain midpoint subdivision algorithm for 3D clipping. **[6]**

b) Explain rotation about an arbitrary axis. **[6]**

Q9) a) Describe the Back face removal algorithm. **[6]**

b) Explain Warnock's algorithm. **[6]**

OR

Q10)a) Explain Z-buffer algorithm. **[6]**

b) Explain the following surface shading methods: **[6]**

i) Constant shading.

ii) Phong shading.

Q11)a) Explain **[6]**

i) B-Spline Curve & Corners,

ii) Frame by Frame animation.

b) Explain the devices for producing animation. **[5]**

OR

Q12)a) Write in brief about fractals and their use in building big, complex pictures. **[6]**

b) Explain GKS & its usage. **[5]**

Total No. of Questions : 12]

SEAT No. :

P3706

[Total No. of Pages : 3

[4961]-53
T.Y. M.C.A. (Under Engineering Faculty)
ADVANCED DATABASES
(2008 Course)

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.***

SECTION - I

Q1) a) Describe Binary Search Algorithm for selection operation. **[5]**

b) How to evaluate expression? Explain pipelined evaluation with suitable example. **[6]**

OR

Q2) a) With suitable diagram explain the basic steps in query processing. **[5]**

b) Explain the nested loop join algorithm with suitable example. **[6]**

Q3) a) Explain any two parallel database architectures in detail with suitable diagrams. **[6]**

b) Explain fragmentation and replication with their advantages and disadvantages. **[6]**

OR

Q4) a) Explain pipelined parallelism and independent parallelism with example. **[6]**

b) What are different types of distributed database systems? Explain advantages and disadvantages of distributed database systems with respect to different applications. **[6]**

P.T.O.

Q5) a) Why complex data types are needed? Illustrate with suitable example. **[6]**

b) Explain type and table inheritance with suitable example. **[6]**

OR

Q6) a) Illustrate array and nested tables with suitable example. **[6]**

b) What is Persistent programming language? Explain persistence in C++. **[6]**

SECTION - II

Q7) a) What is mean by data preprocessing? Why data need to be preprocessed? Illustrate with an example. **[6]**

b) How data is stored in the multidimensional schemea model. Explain any one multidimensional schema in detail with suitable diagram. **[5]**

OR

Q8) a) What is data warehouse? Why it is needed? Give any two applications of data warehouse. **[6]**

b) What are the different OLAP operations? Explain any two OLAP operations with suitable diagram and example. **[5]**

Q9) a) A database has four transactions. Let min _sup = 2, min_conf = 60%. Find all frequently occurred items using Apriori algorithm. Find best rules from support and confidence values. **[8]**

TID	ITEM
10	Chips, coke, ice cream
20	Coke, chips
30	Pizza, ice cream
40	Pizza, coke, chips

b) Write a note on outlier analysis. **[4]**

OR

Q10)a) What do you mean by clustering? What are different clustering techniques? Explain k-means algorithm for clustering with suitable example. **[8]**

b) Write a note on decision tree. **[4]**

Q11)a) What is popularity ranking? Explain with suitable. **[6]**

b) Explain characteristics and architecture of web search engines. **[6]**

OR

Q12)Explain the following terms: **[12]**

a) Synonym.

b) Term Frequency.

c) Inverse Document Frequency.

d) Precision.

e) Recall.

f) Hub.

Total No. of Questions :12]

SEAT No. :

P3707

[Total No. of Pages :2

[4961] - 54

T.Y.M.C.A.

(Engineering Faculty)

ENTERPRISE RESOURCE PLANNING (710904)

(Semester - V) (2008 Pattern)

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

Instructions to the candidates:

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

SECTION - I

Q1) a) List the major modules of ERP. Explain any one in brief **[6]**

b) Explain with example how ERP is useful for planning and decision making. **[6]**

OR

Q2) a) What do you mean preparation of organization for ERP? **[6]**

b) How ERP improves organization's competitiveness? Explain with suitable example. **[6]**

Q3) a) List and explain the roles of various people involved in ERP implementation. **[6]**

b) Discuss the success factors of ERP implementation. **[6]**

OR

Q4) a) What are the most common reasons for ERP implementation failures? **[6]**

b) List and explain ERP implementation strategies. **[6]**

P.T.O.

Q5) What are the basic reasons behind resistance to change by the end users? How to reduce resistance created by end users? **[11]**

OR

Q6) Explain the roles, duties and responsibilities of the people involved in implementing the ERP system. **[11]**

SECTION - II

Q7) a) Explain the selection criteria for ERP Package. **[6]**

b) Explain the importance of customization and training during ERP implementation? **[6]**

OR

Q8) a) Why do organizations preferred to use readymade package instead of developing in house ERP package? **[6]**

b) Explain the role of vendor, consultant and end-users in ERP package implementation. **[6]**

Q9) a) Explain the design and customization issue for ERP package. **[6]**

b) Explain the importance of SCM, CRM, BPR as a front end tool of ERP package. **[6]**

OR

Q10)a) Define and explain the terms data warehousing, data mining with example. **[6]**

b) Why customization is treated as a major factor while designing ERP? **[6]**

Q11)Explain in detail the impact of legacy system, third party software, business process on ERP customization. **[11]**

OR

Q12)In a manufacturing organization, suppose order is accepted by sales team, how it affect on various modules of ERP. **[11]**

Total No. of Questions :12]

SEAT No. :

P3708

[Total No. of Pages :3

[4961] - 55

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

SOFTWARE TESTING

(2008 Pattern) (Elective - II) (710905)

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 diagrms must be drawn wherever necessary.***
3) ***Figures to the right side indicate full marks.***
4) ***Assume suitable data, if necessary.***

SECTION - I

Q1) a) What is a software measurement? Give classification of measures. **[6]**

b) Define data. How to collect, store and extract data? **[6]**

OR

Q2) a) Explain four principle of investigation. **[6]**

b) Explain different measurement scale type. **[6]**

Q3) a) Explain modularity and information flow attributed. **[6]**

b) Short notes on: failure, defect and error. **[6]**

OR

Q4) a) What are the notations used in control flow structures in various programming construct? Draw control flow graph for any program. **[6]**

b) Short note on: quality assurance, quality control and Bug. **[6]**

P.T.O.

Q5) a) What is defect? Explain defect classes and defect severity. **[6]**

b) Explain in detail software testing life cycle. **[5]**

OR

Q6) a) Explain defect life cycle in details. **[6]**

b) What is the difference between verification and validation. **[5]**

SECTION - II

Q7) a) Write a program to find the greatest number from two number. **[6]**

i) Draw control flow diagram (CFD) for the above program.

ii) Calculate the cyclomatic complexity of the program using three technique.

b) What is white box testing? Explain any two white box testing methodologies. **[6]**

OR

Q8) a) Explain McCabe's Cyclomatic complexity in detail with suitable example. **[6]**

b) What is black box testing? Explain any two block box testing methodologies. **[6]**

Q9) a) Explain Boundary Value Analysis & Equivalence class Partitioning with example. **[6]**

b) What is integration testing? What is the difference between top down and bottom up integration. **[6]**

OR

Q10) a) Explain usability testing and security testing. **[6]**

b) What is regression testing? Explain different type of regression testing with example. **[6]**

Q11) a) Explain basic steps involved in problem resolution phase? **[5]**

b) What are the tools & repositories available for problem reporting and explain it. **[6]**

OR

Q12) a) What is software maintenance? Why it is necessary? **[5]**

b) Explain the best practices to follow to improve fix distribution activity? **[6]**

Total No. of Questions : 12]

SEAT No. :

P3709

[Total No. of Pages : 2

[4961]-56
T.Y. M.C.A.(Engg.Faculty)
NEURAL NETWORK AND FUZZY LOGIC
(2008 Course)(Elective-II) (Semester-V)(710905)

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

Instructions to the candidates:

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

SECTION-I

Q1) a) Explain with neat diagram biological neural network. Compare its performance with artificial Neural Network. **[6]**

b) Comment on different types of learning in neural network. **[6]**

OR

Q2) a) Describe McCulloch-Pitts neuron model in detail. **[6]**

b) What is clustering and what are different methods of clustering? Discuss winner takes all learning network. **[6]**

Q3) a) Discuss the single discrete perceptron training algorithm steps. **[6]**

b) Explain how the delta rule is used to adjust the weights of Adaline network. **[6]**

OR

Q4) a) What is an Activation function? Explain Sigmoidal function in detail. **[6]**

b) Define Bias, Weight, Learning rate and Momentum factor. **[6]**

P.T.O.

Q5) a) Explain the architecture and training algorithm used in Hopfield network. **[7]**

b) What are different Expert System applications? **[4]**

OR

Q6) a) Explain Multilayer Perceptron Network in brief. **[7]**

b) Explain Back- Propagation algorithm in detail. **[4]**

SECTION-II

Q7) Differentiate fuzzy set from classical set and name the properties of classical set. **[12]**

OR

Q8) Explain the operation of fuzzy set with suitable example. **[12]**

Q9) a) Explain in brief TSK fuzzy rule based model. **[6]**

b) Discuss conditional fuzzy proposition and unconditional fuzzy proposition. **[6]**

OR

Q10) a) Define DeFuzzification. Explain different methods of DeFuzzification. **[6]**

b) What are the rules based format used to represent the fuzzy information? **[6]**

Q11) a) What are fuzzy implications? Explain with example. **[6]**

b) Explain Categorical and Qualitative reasoning in detail. **[5]**

OR

Q12) a) Compare between probability theory and possibility theory. **[6]**

b) Explain theory of approximate reasoning. **[5]**