

**P1052****[4066]-12**

**F.Y.M.C.A. (Engineering Faculty)**  
**MT - 11 : DISCRETE MATHEMATICS**  
**(Sem. - I) (2005 Pattern) (115002)**

Time : 3 Hours]

[Max. Marks : 70

*Instructions to the candidates:*

- 1) Question No. 1. is compulsory.
- 2) Solve any two questions from the remaining.
- 3) Figures to the right indicate full marks.

**Q1)** a) Show that **[5]**

i)  $(\sim p \wedge (\sim q \wedge r) \vee (q \wedge r) \vee (p \wedge r) \Leftrightarrow r$

ii)  $[(P \wedge Q) \vee (P \wedge \neg Q) \vee (\neg P \wedge Q)] \Leftrightarrow P \vee Q$

b) Let R be the relation on the set A.

$$A = \{5, 6, 8, 10, 28, 36, 48\}.$$

$$\text{Let } R = \{(a, b) \mid a \text{ is a divisor of } b\}$$

Draw the Hasse diagram. Compare with diagraph. Determine whether R is an equivalent relation. **[5]**

c) Show that maximum number of edges in a simple graph with  $n$  vertices

is  $\frac{n(n-1)}{2}$ . **[5]**

d) Consider an algebraic system  $(G, *)$ , where G is a set of all non zero real numbers and  $*$  is a binary operation defined by

$$a * b = \frac{ab}{4}$$

show that  $(G, *)$  is an abelian group. **[5]**

e) Let  $(A, *)$  be an algebraic system where  $*$  is a binary operation such that for any  $a, b \in A$   $a * b = a$  **[5]**

i) Show that  $*$  is an associative operation.

ii) Can  $*$  ever be a commutative operation.

f) Write the following statements in symbolic form : **[5]**

i) Indian economy will shine if the inflation comes down.

ii) If I am not playing tennis or I am not in the office, then I will go for a movie.

iii) If you know Java and C, then you will get a job.

iv) I will score good marks if and only if I study hard.

**P.T.O.**

**Q2)** a) Construct truth tables to find if each of the following is a tautology, contradiction or contingency. [5]

- i)  $p \rightarrow (q \rightarrow p)$
- ii)  $(p \wedge q) \wedge \sim (p \vee q)$
- iii)  $(p \wedge q) \rightarrow p$
- iv)  $(p \rightarrow q) \leftrightarrow (q \vee \sim p)$
- v)  $(p \wedge (\sim p \vee q) \sim q)$

b) Find conjunctive normal form and disjunctive normal form for the following: [5]

- i)  $(p \vee \bar{q}) \rightarrow q$
- ii)  $p \leftrightarrow (\bar{p} \vee \bar{q})$

c) Show that  $\exists y \forall x p(x, y) \Rightarrow \forall x \exists y p(x, y)$  [5]

d) Determine the validity of argument given: [5]

$S_1$  : If I like mathematics then I will study.

$S_2$  : Either I will study or I will fail.

---

$S$  : If I fail then I do not like mathematics.

**Q3)** a) Find the transitive closure of R by Warshall's algorithm, where [5]

$$A = \{1,2,3,4,5,6\} \text{ and } R = \{(x, y) \mid (x - y) = 2\}$$

b) Draw the Hasse diagram of the following sets under partial ordering relation "divides" and indicate those which are chains. [5]

- i)  $\{1, 3, 9, 18\}$
- ii)  $\{3, 5, 30\}$
- iii)  $\{1, 2, 5, 10, 20\}$

c) Let functions f and g be defined by  $f(x) = 2x + 1$  and  $g(x) = x^2 - 2$  [5]  
Find

- i)  $(g \circ f)(a + 3)$
- ii)  $(f \circ g)(a + 3)$
- iii)  $(f \circ g)(5)$

d) Let N be the set of natural numbers including zero. Determine which of the following functions are one - to - one, onto and which are one - to one onto: [5]

- i)  $f : \mathbb{N} \rightarrow \mathbb{N} \quad f(j) = j^2 + 2$
- ii)  $f : \mathbb{N} \rightarrow \mathbb{N} \quad f(j) = j(\text{mod } 3)$

$$\text{iii) } f : \mathbb{N} \rightarrow \mathbb{N} \quad f(j) = \begin{cases} 1 & j \text{ is odd} \\ 0 & j \text{ is even} \end{cases}$$

$$\text{iv) } f : \mathbb{N} \rightarrow \{0,1\} \quad f(j) = \begin{cases} 0 & j \text{ is odd} \\ 1 & j \text{ is even} \end{cases}$$

- Q4)** a) Let  $(A, *)$  be an algebraic system such that for all  $a, b \in A$   
 $(a * b) * a = a (a * b) * b = (b * a) * a$  [5]

Show that :

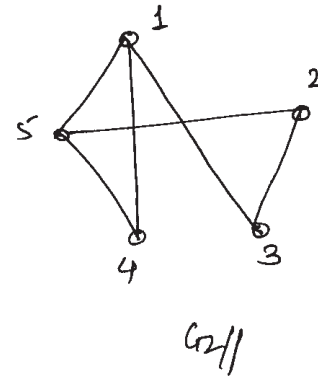
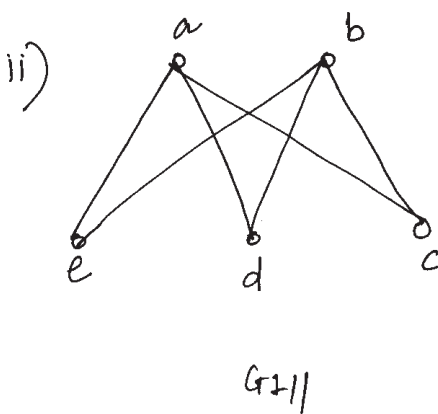
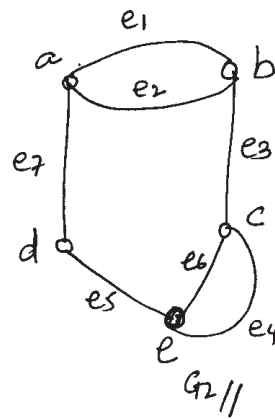
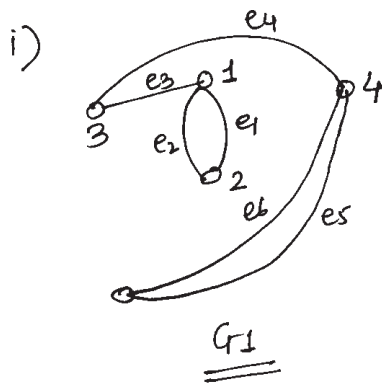
- i)  $a * (a * b) = a * b$ , for all  $a, b \in A$
  - ii)  $a * a = (a * b) * (a * b)$ , for all  $a, b \in A$
  - iii)  $a * a = b * b$ , for all  $a, b \in A$
  - iv)  $a * b = b * a$ , for all  $a, b \in A$
  - v) Let  $(A, *)$  satisfy additional condition  $a * b = (a * b) * b$  for all  $a, b \in A$ . Show that  $*$  is idempotent & commutative.
- b) Let  $(A_1, *)$  and  $(A_2, \square)$  be the two algebraic system as shown in table. Determine whether the two algebraic systems are isomorphic. [5]

$A_1//$				$A_2//$			
*	a	b	c	□	1	w	w <sup>2</sup>
a	a	b	c	1	1	w	w <sup>2</sup>
b	b	c	a	w	w	w <sup>2</sup>	1
c	c	a	b	w <sup>2</sup>	w <sup>2</sup>	1	w

- c) Show that  $(A, +)$  is a group [5]  
 where :  $A = \{\dots, -4a, -3a, -2a, -a, 0, a, 2a, 3a, 4a, \dots\}$
- d) Define the following : [5]
- i) Homomorphism (Group)
  - ii) Automorphism (Group)
  - iii) Abelian Group
  - iv) Subgroup.
  - v) Cyclic group.

Q5) a) Find if the following graphs are isomorphic or not.

[5]



b) An odd fellow wishes to have an odd party attended by odd number of odd people; each of whom is acquainted by odd number of other odd guests at the party. Can this odd situation occur? [5]

c) Define planar graph. Let  $G$  be a connected graph with  $p$  vertices and  $q$  edges where  $p \geq 3$  then show that  $q \leq 3p - 6$ . [5]

d) Define following graphs and give an example of each : [5]

- i) Bipartite graph.
- ii) Complement of graph.
- iii) Complete graph.
- iv) Subgraph.
- v) Complete Bipartite graph.



**P1053**

**[4066]-13**

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

**FOUNDATIONS OF INFORMATION TECHNOLOGY**

**(2005 Pattern) (Sem. - I) (115003)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Figures to the right indicate full marks.*
- 3) *All questions are compulsory.*

**SECTION - I**

- Q1)** a) What are the basic building blocks of organization of computer system? Explain in detail the function of each block. [9]
- b) Convert the following : [8]
- i) 392 to Binary.
  - ii)  $(11011011)_2$  to Hex.
  - iii)  $(1715)_8$  to Decimal
  - iv) 899 to Octal.

OR

- Q2)** a) Explain in detail design of Half Adder and Full Adder with truth table. [10]
- b) Explain characteristics of computers. [7]
- Q3)** a) Explain different types of processors giving its advantages and limitations. [9]
- b) What is a Storage unit? Explain the characteristics of storage unit. [8]

OR

- Q4)** a) Draw the functional block diagram of the Processor memory architecture of a computer system and explain the function of each block in detail. [10]
- b) What are data scanning devices? Explain the characteristics of data scanning devices. [7]
- Q5)** a) State and explain the characteristics of a good programming Language. [6]
- b) What is a software? List and explain the steps involved in developing a software. [6]
- c) Compare Compiler and Interpreter. [4]

**P.T.O.**

OR

- Q6)** a) What is a software? List and explain different types of software. What are the key functions performed by the system software? [8]  
b) What is a software package? Explain the steps followed for in-house development of software package. [8]

**SECTION - II**

- Q7)** a) What is a process? What are the different mechanisms for process management in operating system? [8]  
b) Explain some common features provided in a word processing package. [4]  
c) What are the aspects of Security in Operating System? [5]

OR

- Q8)** a) What is a Virtual memory? Explain the basic concepts used for the realization of virtual memory. [8]  
b) Explain some common features provided in a Spread sheet package. [4]  
c) What are the file operations provided by an operating system? [5]

- Q9)** a) Explain with diagram the main components of a database management system. [9]  
b) What are the different modes of File Organization? Give advantages and disadvantages of each. [8]

OR

- Q10)** a) What is a Data Base Management System? State and explain different models of a database. [8]  
b) List and explain advantages and disadvantages of Direct Access files. [6]  
c) Differentiate between testing and debugging. [3]

- Q11)** a) What is a Network? Explain with neat diagram the 7 layer OSI Network model. [9]  
b) Explain different types of switching techniques and list advantages and disadvantages of each. [7]

OR

- Q12)** a) What is Distributed Computing? What are its advantages? [7]  
b) What is Data Transmission? Explain various data transmission media in detail. [9]



Total No. of Questions : 12]

[Total No. of Pages : 2

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**[4066]-45**

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

**JAVA PROGRAMMING**

**(2005 Pattern) (Sem - IV) (215013)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*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 whenever necessary.*
- 4) *Figures to the right indicate full marks.*

**SECTION - I**

- Q1)** a) Explain concept of a Iterator. Explain methods in Iterator interface. [8]  
b) What is the difference between a array and a Vector? Explain functions of Vector class. [8]

OR

- Q2)** a) Explain Hash table. Also explain methods of Hash table. [8]  
b) What is inheritance? With example explain use of super keyword in it. [8]

- Q3)** a) What is Choice control in Java. Explain any five methods of it. [8]  
b) What are different Event classes in Java? [8]

OR

- Q4)** a) Write a program to display a “Hello” message in the window when left mouse button is clicked. [8]

- b) Write the similarities and dissimilarities between swing and AWT. [8]

- Q5)** a) With example explain HTML applet Tag. [9]

- b) List various methods in Applet class. Explain in detail all the methods. [9]

OR

- Q6)** a) Write an applet program that accepts two input string using <param> tag and concatenate the strings and display it in window. [9]

- b) What are the different ways to execute applet? Explain with example. [9]

**P.T.O.**

**SECTION - II**

- Q7)** a) Write a program to accept five numbers from the user, find total and average of these numbers and display result on the screen. [8]  
b) What is string tokenizer class? Explain in detail. [8]

OR

- Q8)** a) Write a program to accept two numbers from user. Also accept a choice to perform various arithmetic operations like addition, subtraction, multiplication and division on them. Display the result. [8]  
b) Distinguish between [8]  
i) Inputstream and Reader classes.  
ii) Outputstream and Writer classes.

- Q9)** a) How to connect a database into Java application? Explain it with simple application. [8]  
b) Differentiate between JDBC and ODBC. [8]

OR

- Q10)** a) Explain different JDBC drivers. [8]  
b) Explain Prepared Statement in detail. [8]

- Q11)** a) Explain Server Socket and Datagram Socket classes. [9]  
b) Explain different Network Exceptions? [9]

OR

- Q12)** a) What are the difference between TCP and UDP? [9]  
b) Explain the following classes and methods in detail with example. [9]  
i) Inet Address.  
ii) Inet Address get By Name()





Total No. of Questions : 12]

[Total No. of Pages : 3

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

MANAGEMENT SCIENCE

(2005 Pattern) (Sem. - I) (115005)

*Time : 3 Hours]*

*[Max. Marks :100*

*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) Give in brief historical developments in the management philosophy. **[8]**  
b) Define management. Explain different functions of management. **[8]**

OR

- Q2)** a) Discuss the contributions of F.W. Taylor and Gilbreth to the management philosophy. **[8]**  
b) Mention any four administrative concepts of effective management and discuss two of them in brief. **[8]**

- Q3)** Write short notes on any three of the following: **[18]**
- a) Peculiarities of Human Wants,
  - b) Relevance of Chambers of Commerce,
  - c) Benefits of e-governance,
  - d) Major provisions of IPR.

**P.T.O.**

OR

**Q4)** Discuss any three of the following: [18]

- a) Unique Identification Number and e-governance,
- b) Economy of Scale,
- c) Elasticity of supply
- d) Ecommerce.

**Q5)** a) Differentiate between Co-operative sector and Public Sector. Undertakings, mentioning the benefits and limitations of these two types of organizations. [8]

b) Which are different forms of organizations? Why are these existing? Mention any two important benefits for each of these forms.. [8]

OR

**Q6)** a) Discuss the merits and demerits of Line Organization, Functional Organization and Line and Staff Organization. [8]

b) Is the Public Sector relevant in the current situation? Justify. [8]

### SECTION - II

**Q7)** Discuss in brief important aspects of the following:

a) Maslow's Theory of need hierarchy. [8]

b) McGregor's Theory X and theory Y. [8]

OR

**Q8)** a) Differentiate between Job Evaluation and Merit Rating. [8]

b) With the help of block diagram explain the communication process. What are the barriers in the communication process? [8]

**Q9)** Write short notes on any three of the following: [18]

a) Important provisions of the Factories Act, 1948.

b) Purpose of enactment of the Pollution Control Act, 1977.

c) Meaning of the term 'Factory' as per the Factories Act, 1948.

d) Precautions for accident prevention in industry.

OR

- Q10)** a) Discuss the relevance of the Factories Act, 1948 in the current environment. [6]  
b) What steps can be taken to avoid pollution in different sectors of economy? [6]  
c) Discuss the possible causes of accident in industry and how can these be prevented? [6]
- Q11)** a) Mention the provisions relating to traceability in ISO 9000. [8]  
b) Explain the concepts of Quality Control and Quality Assurance. Do they differ from each other? Justify. [8]

OR

- Q12)** a) Differentiate between Patent and Copy Right. [6]  
b) Discuss the importance of Quality Assurance. [5]  
c) What is meant by TQM? How can this be implemented? [5]



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**F.Y. M.C.A. (Engineering Faculty)**  
**DATA STRUCTURES AND FILES**  
**(2005 Pattern) (Sem. - II) (115010)**

*Time : 3 Hours]*

*[Max. Marks :100*

*Instructions to the candidates:-*

- 1) *Answer any three questions from each section.*
- 2) *Answer three questions from Section - I and three questions from Section - II.*
- 3) *Answers to the two sections should be written in separate answer books.*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*
- 6) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 7) *Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Write a program to perform addition of two polynomials using arrays. Also find time complexity of your program. [8]  
b) Define the following terms. [8]  
i) Data structures. ii) ADT.  
iii) Data Object. iv) Data Type.

OR

- Q2)** a) Write a program to perform addition of two sparse matrices. [10]  
b) Differentiate between sequential & linked organization. [6]

- Q3)** a) Write a 'C' program to sort a given linked list & display sorted linked list. [8]  
b) Write a 'C' function to add a node in doubly linked list at any position. [6]  
c) Compare SLL with DLL. [4]

OR

- Q4)** a) What is GLL? Give 'C' structure for the polynomial using GLL. Represent the following polynomial using GLL: [12]  
 $3x^{10}y^3z^2 + 5x^8y^3z^2 + 7x^8y^2z^2 + x^4y^4z + 6x^3y^4z + 9yz$   
b) Write an algorithm to traverse SLL in reverse order. [6]

*P.T.O.*

- Q5)** a) Write pseudo 'C' algorithm to convert infix expression to postfix. [8]  
b) Explain concept of priority queue with suitable example. [8]

OR

- Q6)** a) Write 'C' functions to implement stack using array & linked list. [8]  
b) Evaluate the following postfix expression using stack. [8]  
 $623 + -382 / + *2\$3 +$   
Where \$ = exponentiation.

### SECTION - II

- Q7)** a) Write a non-recursive 'C' function to traverse a binary tree in post-order. [6]  
b) Describe the methods of the graph representation with suitable example. [8]  
c) Write a 'C' function to search a node from binary search tree. [4]

OR

- Q8)** a) Differentiate between BFS & DFS of the graph. [8]  
b) Write a non-recursive 'C' function to delete a node from binary search tree. [10]

- Q9)** a) Sort the following set of numbers using quick sort. [8]  
25, 57, 48, 37, 12, 92, 86, 33.  
b) Write a program to perform binary search. [8]

OR

- Q10)** a) Write an non-recursive algorithm for merge sort. [8]  
b) Write a short note on index sequential search with suitable example. [8]

- Q11)** a) Differentiate between sequential & direct access file. [8]  
b) Explain different hashing methods. What are different collision resolution techniques? Explain any one of them. [8]

OR

- Q12)** a) What is the probing in the hash table? What is linear Probing? How does it differ from quadratic probing? [8]  
b) Write a short note on: [8]  
i) Index sequential file.  
ii) Application of hash table.



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

**WEB TECHNOLOGY**

**(2005 Pattern) (Sem. - IV) (215010)**

*Time : 3 Hours]*

*[Max. Marks :100*

*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 answer books.*
- 4) *Figures to the right indicate full marks.*
- 5) *Make suitable assumptions wherever appropriate and relevant.*

**SECTION - I**

**Q1)** Write in brief as to what one means by terms/concepts given here **[18]**

- |                    |                             |
|--------------------|-----------------------------|
| a) Form validation | b) WWW                      |
| c) Repeaters       | d) Http session             |
| e) Internetworking | f) Application layer of OSI |

OR

**Q2)** Write short Notes on ANY THREE: **[18]**

- a) Features of typical Web browsers
- b) Network devices (Hint routers. . .)
- c) ARP protocol
- d) Web pages : types and issues

**Q3)** a) Write short notes on HTML **[6]**

b) How and When will one use the following HTML/DHTML elements / widgets/tags in a web page design, illustrate with suitable examples. **[6]**

- i) Frames
- ii) headings
- iii) links

c) Compare HTML and DHTML. **[4]**

*P.T.O.*

OR

- Q4)** a) Write short notes on HTML text formatting tags (with examples). [6]  
b) Design and draw LOGIN form/s (with three chances for user to give correct password). Write html code to display the form you have shown (make suitable assumptions and state them) [6]  
c) What are cascading style sheets and their use [4]
- Q5)** What do you understand by following terms/concepts, Explain with examples: [16]  
a) Client side scripting  
b) Use of JavaScript for FORM validations  
c) java script variables  
d) java script try catch throw

OR

- Q6)** What do you understand by following terms, illustrate with code examples: [16]  
a) FOR loop  
b) BREAK loops  
c) Constructors  
d) Operators

### **SECTION - II**

- Q7)** a) What is DOM for HTML and how does one access HTML elements using JAVASCRIPT/DOM, give examples. [12]  
b) What do you understand by Java script execution environment. [4]

OR

- Q8)** a) Write a simple sample HTML page for showing a STUDENT'S name, address and contact information. Make suitable assumptions. For above HTML page show/draw the DOM tree and then show with some examples how to manipulate HTML using DOM. [10]  
b) Write short notes on JavaScript event handling [6]
- Q9)** a) Write short Notes on servlets API. [6]  
b) Write short notes on WEB servers. [6]  
c) Give a small code example of any SERVLET. [4]

OR

- Q10)** a) Are servlets used on client side, or server side, what kind of applications can make use of servlets, explain with examples. [6]  
b) What are advantages of servlets. [6]  
c) How does servlets handle sessions. [4]

- Q11)** a) Write short notes on buffers and channels. [6]  
b) Compare and contrast server and client side sockets. [6]  
c) What do you understand by proxy servers. [6]

OR

- Q12)** Write short Notes on ANY Three: [18]  
a) Networked applications  
b) Internet applications  
c) TCPIP addressing  
d) .nio  
e) Java and support for networking in JAVA





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P1078

**M.C.A. (Under Faculty of Engineering)**

**FOUNDATIONS OF INFORMATION TECHNOLOGY**

**(2008 Pattern) (Sem. - I) (510903)**

*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 be written in 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) How many types of storage are normally there in the storage unit of a computer system. Justify the need for each storage type. [4]
- b) Convert  $(11010011)_2 = (?)_{16}$  [4]  
 $(ABC)_{16} = (?)_2$
- c) Show the binary digits used to record the word base in BCD. [4]

OR

- Q2)** a) What is an IC? How does it help in reducing the size of computers? [4]
- b) Convert following numbers to binary [4]
- i)  $(435)_2$
  - ii)  $(2ac)_{16}$
- c) Define the term 'byte'. What is the difference between a bit and a byte? [4]

- Q3)** a) What are data scanning devices? Give characteristics of data scanning devices. [4]
- b) What is flat panel monitor? Where is it commonly used? [4]
- c) List out the main steps involved in the execution of an instruction by the CPU of a computer system. [4]

*P.T.O.*

OR

**Q4)** a) What is meant by family of CPUs? When do two CPUs belong to the same family? [4]

b) Differentiate between PROM and EPROM. [4]

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

**Q5)** a) What are the different ways of acquiring software? List out their relative advantages and limitations. [6]

b) What are the characteristic of good programming language? [5]

OR

**Q6)** a) Compare [6]

i) Interpreter and compiler

ii) Natural language and high level computer language

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

### **SECTION - II**

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

b) Define personal assistance package. List the features of it. [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) Define the following terms: [4]

i) Multitasking

ii) Time sharing

iii) Multiprogramming

iv) Multiprocessing

- Q9)** a) What is Documentation? Explain different forms of documentation? [4]  
b) What is a database model? Name the four commonly used database models and describe any two. [8]

OR

- Q10)** a) What are the two standard methods used in data processing system for organizing data? Explain their relative advantage & disadvantages. [8]  
b) Describe drawbacks of traditional information processing system that use separate, unrelated files. [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 circuit” Explain. [5]

OR

- Q12)** a) Describe some of the typical uses of Internet. [6]  
b) What do you understand by modulation and demodulation? What are modems? [5]



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**F.Y. M.C.A. (Engineering Faculty)**  
**MICROPROCESSOR APPLICATIONS**  
**(2008 Pattern) (Sem. - II) (510912)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:-*

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

**SECTION - I**

**Q1)** a) Draw the functional block diagram of 8085. Explain in detail. [8]

b) What are the latches and the buffers? Explain their role in interfacing. [4]

OR

**Q2)** a) Explain the function of each pin of 8085. [8]

b) What is partial and full decoding? [4]

**Q3)** a) Draw and explain the timing diagram for the instruction LXI H, 2400H. [7]

b) Explain various addressing modes of 8085. [5]

OR

**Q4)** a) Explain how the stack is accessed during the execution of CALL and RET instructions. [6]

b) How does the processor communicate with the slower I/O? [6]

**Q5)** a) Design an interface for 4 × 4 Keyboard and write the initialization code in 8085 ALP. [7]

b) Explain polling for communicating with I/O. [4]

OR

**Q6)** a) Compare Memory mapped I/O and I/O mapped I/O. [4]

b) Explain BSR mode of 8255 PPI. [7]

*P.T.O.*

## SECTION - II

- Q7)** a) Explain mode 3 and 4 of 8253. [8]  
b) List all the 8085 vector interrupts with their priorities. [4]

OR

- Q8)** a) What is ISR? Explain how is it executed with example. [7]  
b) Draw functional block diagram of 8253. [5]

- Q9)** a) Explain maximum mode of operation in 8086. [8]  
b) Detail all the flags of 8086 flag register. [4]

OR

- Q10)** a) Draw the programmer's model of 8086. Explain various blocks of it. [7]  
b) Explain segmentation with neat diagram. [5]

- Q11)** a) Give various addressing modes of 8086 with example. [5]  
b) Write an 8086 assembly language program to add an array of 58-bit numbers. [6]

OR

- Q12)** a) Write an 8086 assembly language program to count 8-bit negative numbers in an array. [7]  
b) List and explain the DOS Calls for accepting the character(s) through keypad. [4]



P1080

[4066] - 301

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

OPERATING SYSTEMS

(2008 Pattern) (Sem. - III) (610901)

*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) *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) What is the use of stack in Macro-Processor? Give Example. [6]  
b) Explain the components of system software in detail. [6]

OR

- Q2)** a) What features of assembly language makes it mandatory to design a two pass assembler? Explain with suitable example. [6]  
b) State various activities of language processing. [6]

- Q3)** a) Explain the relocating loader with its advantages and disadvantages. [6]  
b) Compare top-down and bottom-up parser. [6]

OR

- Q4)** a) List various phases of compiler. Explain optimization in detail. [6]  
b) Define the following terms. [6]  
i) Cross compiler  
ii) Optimizing compiler  
iii) Bootstrap compiler

*P.T.O.*

- Q5)** a) Explain the following [5]  
i) Real Time operating system  
ii) Time sharing operating system.  
b) What is process? What is process control block(PCB)? Explain in detail [6]

OR

- Q6)** a) Write algorithm for non-preemptive priority job scheduling algorithm. [6]  
b) Comment on “one can view the operating system as resource allocator”. [5]

## SECTION - II

- Q7)** a) Explain the following term: [4]  
i) Fixed partitioned allocation  
ii) Variable partitioned allocation  
b) What is paging? Explain any two page replacement algorithm. [8]

OR

- Q8)** a) Explain the concept of segmentation? What is paged segmentation? What are different types of segment? [6]  
b) What is difference between paging and segmentation. [6]

- Q9)** a) List the contents of file directory entry. [4]  
b) What are the different issues related to disk performance? Explain any one disk scheduling algorithm with suitable example. [8]

OR

- Q10)** a) What are the advantages and disadvantages of C-SCAN scheduling algorithm? [6]  
b) Explain two level and tree structured directory. [6]

- Q11)** a) Draw and explain the basic structure of Linux file system. [5]  
b) State and explain fork, wait, exec process management system calls. [6]

OR

- Q12)** a) What are the components of Linux operating system? Explain. [6]  
b) Explain Inode assignment to new file [5]



[4066] - 303

P1081

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

FINANCIAL ACCOUNTING AND MANAGEMENT

(2008 Pattern) (Sem. - III) (610903)

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) Draw figures and tables as required.
- 5) Figures to the right indicate full marks.

**SECTION - I**

**Unit - I**

- Q1)** a) Explain in detail, the principles and conventions used for financial accounting. [6]
- b) Explain the importance of different financial statements for IT organization. [6]

OR

- Q2)** a) Explain in detail, the process and elements widely used in maintenance of Journals or recording of different transactions. [6]
- b) Explain the importance of profit and loss account and balance sheet for any service industry. [6]

**Unit - II**

- Q3)** a) What are different Overhead costs? How overheads affects the process of preparing cost sheet? [6]
- b) What is the importance of Ratio Analysis in business operation? Describe in detail. [6]

P.T.O.



OR

- Q4)** a) Explain Marginal costing and Marginal Safety for business operation. [6]  
b) Explain different Ratio Analysis methods used in business operation. [6]

**Unit - III**

- Q5)** a) Explain the operational significance of Gross and net working capital. [5]  
b) What are the factors influencing the working capital? Explain in detail. [6]

OR

- Q6)** a) What are the dangers of Excessive and Inadequate working capital? Explain in brief. [5]  
b) Explain the process of estimation of working capital in detail. [6]

**SECTION - II**

**Unit - IV**

- Q7)** a) A project costs Rs. 20 lakhs and yields annually profit of Rs. 3,00,000/- after depreciation at 12.5 percent but before tax at 50 percent. Calculate pay back period and suggest whether it should be accepted or rejected based on 6 year standard pay back period. [6]  
b) Explain the importance of capital budgeting in detail. [6]

OR

- Q8)** a) A project costs an initial investment of Rs. 40,000/- and is expected to generate annual cash inflows of Rs. 16,000/- for 4 years. Calculate Internal Rate of Return (IRR). [6]  
b) What are difficulties faced in capital budgeting? Explain in detail. [6]

**Unit - V**

- Q9)** a) A company has earnings available to ordinary shareholders Rs. 5,00,000/-. It has capital Rs. 50,00,000/- face value of Rs. 100 each. The company's share is selling at Rs. 200. Compute cost of equity based on face value and cost of equity based on market price. [6]  
b) Explain basic aspects (rate of return, business risk and financial risk) of cost of capital. [6]

OR

- Q10)** a) A company issues 12,000, 12 percent preference shares of Rs. 100 each. Company is expected to pay 2 percent as floatation cost. Calculate the cost of preference shares assuming issued at [6]
- i) face values or par value and
  - ii) at a discount of 5%.
- b) Explain cost of equity, overall cost of capital, and marginal cost of capital. [6]

**Unit - VI**

- Q11)** a) What may be the important components in accounting information systems for transaction processing and financial reporting tool? [5]
- b) Explain different features of Tally 9.0 with respect to debit note, credit note, purchase order and sales order. [6]

OR

- Q12)** a) What may be the important components of online accounting report systems? Justify any two components. [5]
- b) Explain the importance of components of Tally 9.0 as automated accounting tool. [6]



*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) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 5) *Assume suitable data, if necessary.*

**SECTION - I**

**Q1)** Write the answers of following: **[12]**

- a) What is Multimedia? List the building blocks of Multimedia.
- b) Define frame rate. What are the frame rates of television and movie films?
- c) Define Hypermedia?
- d) What is authoring? Name four products that offer authoring features.
- e) What is streaming?
- f) What is Multimedia database? Give two examples of MMDB.

OR

**Q2)** a) Explain Goals and Objectives of Multimedia. **[6]**

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

List the protocols used in streaming.

**Q3)** a) Compare MPEG II and MPEG IV. **[6]**

b) Explain the process of image recognition. **[5]**

*P.T.O.*

OR

**Q4)** a) What is image enhancement? Explain how it is achieved using the contrast stretching. [6]

b) Explain Lossy and lossless compression with one example each. [5]

**Q5)** a) How audio is captured? Explain components in the audio capturing system. [6]

b) Explain AVO and AVI file formats of audio. [6]

OR

**Q6)** a) Why compression is necessity in multimedia applications? Explain MP3 Audio Compression. [6]

b) Discuss the factors that determine size of file and quality of sound for audio capture and playback. What are various chunks present in a sound file stored as WAV format? [6]

### **SECTION - II**

**Q7)** a) Which are the different layers in MPEG? Define and explain I, P and B frames with reference to MPEG. [6]

b) Describe a CD-ROM in terms of- [5]

i) The layers in it

ii) Layout of tracks

iii) Lands and pits on it

OR

**Q8)** a) Generate the Huffman encoding tree and codes for the example - Characters A, B, C, D and E have the following probability of occurrence:  $p(A) = 0.16$ ,  $p(B) = 0.51$ ,  $p(C) = 0.09$ ,  $p(D) = 0.13$ ,  $p(E) = 0.11$ . [6]

b) Explain adoptive LZW Compression algorithm. [5]

**Q9)** a) What is Virtual Reality? Explain any two virtual reality devices. [6]

b) Explain features of VRML 2.0 using examples. Write pseudo code for basic objects like cone and cylinder. [6]

OR

- Q10)** a) Explain any two applications of Virtual Reality. [6]  
b) Why does it take four nodes to make simple object in VRML and which are those? [6]

- Q11)** a) Explain different techniques of animation. [6]  
b) Discuss impact and use of [6]  
i) Interpolation  
ii) Parameter Curve editing  
iii) Inverse kinematics  
iv) Motion Paths  
in the development of animations.

OR

- Q12)** a) Explain how animations can be used in the movie making. [6]  
b) Explain client pull and server-push animations. [6]



[4066] - 401

P1083

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

SOFTWARE ENGINEERING

(2008 Pattern) (Sem. - IV) (610909)

Time : 3 Hours]

[Max. Marks :70

Instructions to the candidates:-

- 1) From section I, answer Q.1 or Q.2, Q.3 or Q.4, Q.5 or Q.6.
- 2) From section II, answer Q.7 or Q.8, Q.9 or Q.10, 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) Figures to the right indicate full marks.
- 6) Assume suitable data, if necessary.

**SECTION - I**

- Q1)** a) What do you understand by Evolutionary model? Draw and explain the Spiral model with its advantage and disadvantages? [8]
- b) What do you understand by Umbrella Activities which we applied throughout the software process? [4]

OR

- Q2)** a) Explain the phases of unified process with the suitable diagram? [8]
- b) What do you mean by Team Process Model (TPM) and Personal Process Model (PPM)? [4]

OR

- Q4)** a) Explain with diagram the Hatley-Pirbhai system modeling? [8]
- b) How System modeling is achieved using UML? What are the importance of Use-Case diagram? [4]

- Q5)** a) Describe the Class Responsibility Collaboration model with example? [8]
- b) Draw the High level Use-case diagram for Railway reservation system? [3]

P.T.O.

OR

- Q6)** a) What are the goals of Requirement Engineering? Justify why requirement Engineering works as a bridge between Design and Construction? [8]  
b) Draw the swim lane diagram for Railway reservation system? [3]

**SECTION - II**

- Q7)** a) What are the golden rules of User interface design? Explain in detail?[8]  
b) High Cohesion and low coupling is required for efficient software why? [4]

OR

- Q8)** a) What do you mean by modularity? For a good quality software why modularity is important justify it? [8]  
b) How we perform Design evaluation explain it with suitable diagram? [4]

- Q9)** a) What do you understand by White box testing? Explain the following terms-Flow graph notation and Cyclomatic complexity. [8]  
b) What is the difference between Alpha and Beta testing explain with example? [4]

OR

- Q10)** a) What do you mean by Black box testing? Explain the following terms-Equivalence Partitioning and Boundary value analysis. [8]  
b) What is the difference between Verification and Validation explain with example? [4]

- Q11)** a) Explain with example the Function Point metric? [8]  
b) What do you mean by Software metric describe its advantages? [3]

OR

- Q12)** a) What do you mean by Software Quality? Explain the Mc'Calls and FURPS quality factors? [8]  
b) What is the purpose of Software Maintenance? Explain the maintenance metric? [3]



P1084

[4066] - 403

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

**OBJECT ORIENTED ANALYSIS & DESIGN**

**(2008 Pattern) (Sem. - IV) (610911) (Theory)**

*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) Write a short note on CORBA services [6]  
b) Describe Rational Unified Process in detail [6]

OR

- Q2)** a) Explain aggregation and Component Relationship (Composition). [6]  
b) Explain object oriented features with example. [6]

- Q3)** a) Write short notes on [6]  
i) Generalization and Specialization  
ii) Advantages of OOAD  
b) What are the three parts of a class in UML class symbol? Discuss with example. [6]

OR

- Q4)** a) Describe Realization and dependency relationship with example. [6]  
b) Explain inheritance and its types with examples. [6]

*P.T.O.*



- Q5)** a) Based on the following description, design and define use case diagram: [6]

An engineering College has organized an International Research Conference with various subject tracks. A website is developed by the college where all the conference details are uploaded. The participant has to register online under the category - Student, Faculty, Research Scholar, Corporate. He has to upload an abstract of his paper. If it gets selected, he has to upload final paper along with the registration fees. The registration fees varies according to the category of the registrant. The payment can be done online or through DD. The paper presentation schedule is put up on the website under the defined tracks. After the conference the participant can give his feedback online.

- b) Draw class diagram for the system in Q.5 a. [5]

OR

- Q6)** a) What is conceptual difference between “extend” and “include” relationship? Give example of each relationship. [5]

- b) Create a use case diagram for library management system. [6]

### **SECTION - II**

- Q7)** a) Explain the utility value of sequence diagram. What are the notations used for sequence diagram? [6]

- b) Draw sequence diagram for the following scenarios: [6]

- i) Adding contacts in mobile  
ii) Searching for a contact in a mobile and calling your friend on mobile.

OR

- Q8)** a) What are different types of interaction diagrams? Discuss in brief. [6]

- b) Draw communication diagram to withdraw money from bank ATM. [6]

- Q9)** a) Draw a state transition diagram for fully automated washing machine. [6]

- b) Explain use of frame and lifeline in UML sequence diagram. [6]

OR

**Q10)** a) Explain the following with respect to state transition diagram [6]

i) Event

ii) State

iii) Transition

b) Discuss fork and join with example [6]

**Q11)** a) Explain artifacts. How they are used in deployment diagrams? [5]

b) Draw a package diagram for “Online shopping of products”. Write the assumptions about the scope of the system. [6]

OR

**Q12)** a) What is UML component? Explain need of component diagram with example. [5]

b) How deployment diagram will be useful to fully distributed client and server system? [6]



**P1085**

**[4066] - 405**

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

**HUMAN COMPUTER INTERFACE**

**(2008 Pattern) (Sem. - IV) (610913) (Elective - I)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:-*

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

**SECTION - I**

- Q1)** a) What is reasoning? Explain different type of reasoning with example. [6]  
b) Justify the following statement “Extensive knowledge about the human eye or visual system can be made applicable in the practical user interface design”. [6]

OR

- Q2)** a) Explain the following terms related to human short term memory Digital Span, Chunking, Regency Effect, Closure. [6]  
b) What do you mean by ‘use of Metaphor’ in HCI? Explain any five metaphors used to teach new concept in interactive interface design. [6]

- Q3)** a) Explain eight golden rules of interface design. Give suitable examples to justify your answer? [6]  
b) Explain GOMS and Keystroke level model. [6]

OR

- Q4)** a) Explain the linguistic model - BNF and task action grammar in brief? [6]  
b) With help of Norman’s Model of interaction explain the process of execution evaluation cycle. What is meant by gulf of execution and gulf of evaluation with respect to this model. [6]

- Q5)** a) Explain three Pillars of Interface Design. [6]  
b) Explain how scenarios help in the design process of interactive systems. [5]

*P.T.O.*

OR

- Q6)** a) What is participatory design? Explain with suitable examples. [5]  
b) Wrote note on: [6]  
i) LUCID.  
ii) Ethnographic observation.

**SECTION - II**

- Q7)** List different type of menus. Explain when and why to use a particular menu system with example. [12]

OR

- Q8)** a) Explain different command organization strategies. [6]  
b) Write a note on Expert reviews. [6]

- Q9)** Discuss advantage and disadvantage of online manuals. Also discuss the facilities that can be provided in online manuals which might not be practical in printed manuals. [11]

OR

- Q10)** a) Explain in brief any three application of hypermedia. [6]  
b) Explain with example face to face communication and asynchronous interaction in CSCW? [5]

- Q11)** Write a note on (any three): [12]  
a) Share Editors  
b) Multimedia document searches  
c) Comparisons of pointing devices  
d) Organization design to support usability

OR

- Q12)** a) Give benefits and problem of touch screen and voice recognitions input. [6]  
b) Some of the favorite techniques of web pages these days include automatic scrolling text boxes, moving marquees and constantly running animations. Discuss these features in terms of web pages design guideline. [6]



Total No. of Questions : 6]

[Total No. of Pages : 2

**P1085**

**[4066] - 405**

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

**ORGANIZATION BEHAVIOR**

**(2008 Pattern) (Sem. - IV) (610913) (Elective - I)**

**(Theory)**

*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 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) i) Compare Autocratic model, Custodial Model, Supportive Model and Collegial Model of Organizational Behavior. [6]  
ii) Explain in detail Goal setting and Reward system. [6]

OR

- b) i) Explain Primary and Secondary motives. [6]  
ii) Explain in detail Autocratic and Supportive Model of Organizational Behavior. [6]

- Q2)** a) i) Which are the defense mechanism for interpersonal conflict frustration? Which are the different types of motives? [6]  
ii) Explain Douglas McGregor's theory 'X' and 'Y'. [5]

OR

- b) i) Explain Fredrick Herzberg's two factor theory of motivation. [6]  
ii) Explain the. relationship of Morale to Productivity [5]

- Q3)** a) Write short notes on: (any THREE): [12]  
i) Conflict Management.  
ii) Performance Appraisal.  
iii) Types of Groups.  
iv) Team Effectiveness.

*P.T.O.*

OR

- b) i) Which factors influence the human resource planning in an organization. [6]  
ii) Explain how to handle levels of conflicts within an organization. [6]

**SECTION - II**

- Q4)** a) i) Define Leadership and list the qualities of a leader. [5]  
ii) Write short notes on: [6]  
1) Life Cycle Theory.  
2) Organizational Design.

OR

- b) i) Write short notes on : [6]  
1) Organizational Climate.  
2) Leadership Style.  
ii) Explain Fielders Contingency model of leadership. [5]

- Q5)** a) i) What are the forces responsible for Change. [6]  
ii) What are the strategies for conflict resolution. [6]

OR

- b) i) Write short notes on: [8]  
1) Resistance to change.  
2) Constructive Conflicts.  
ii) How the change within an organization leads to the effective development of an organization. [4]

- Q6)** a) Write short notes on: [12]  
i) Downsizing.  
ii) Benefits of T.Q.M.  
iii) Learning organization.  
iv) Benchmarking.

OR

- b) i) What is Quality in turn of an organization? Explain the techniques of T.Q.M. [6]  
ii) What is the relation of re-engineering with empowerment? [6]



[4066] - 21

P1092

**F.Y. M.C.A. (Engineering Faculty)**  
**OBJECT ORIENTED PROGRAMMING**  
**(2005 Pattern) (115009) (Sem. - II)**

*Time : 3 Hours]*

*[Max. Marks :100*

*Instructions to the candidates:-*

- 1) *Answer Q.1 or Q.2 and Q.3 or Q.4 and Q.5 or Q.6 and Q.7 or Q. 8 and Q.9 or Q.10 and Q.11 Q.12 .*
- 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) *Your answer will be valued as whole.*
- 6) *Make suitable assumptions wherever appropriate and relevant.*

**SECTION - I**

- Q1)** a) List characteristics and limitations of procedural programming? [10]  
b) Explain the following with example: [7]  
i) Information Hiding  
ii) Message passing  
iii) Classes and objects

OR

- Q2)** a) Compare procedural programming and Object Oriented Programming. [7]  
b) Explain the following with example: [10]  
i) Data encapsulation  
ii) Data abstraction  
iii) Message Passing  
iv) Friend Function  
v) Methods

**P.T.O.**

- Q3)** a) What are constructors and destructors? Explain with example. [6]  
b) Explain inline function with example. [5]  
c) Write a C++ program to calculate the area of circle and rectangle by implementing function overloading. [6]

OR

- Q4)** a) Does 'new' do more than allocate memory? Why is 'new' operator better than malloc()? [6]  
b) Explain static member functions with example. [5]  
c) Write a program in C++ to create a database for student mark sheet using array of objects. [6]

- Q5)** a) What is type conversion? Explain different types of type conversion with example. [8]  
b) Make use of hybrid inheritance to create a student information system for an Institute having student of Engineering & Medical. [8]

OR

- Q6)** a) What are its different types of polymorphism ? Explain runtime polymorphism with a sample program. [8]  
b) What is operator overloading? Explain different ways of overloading a binary operator. [8]

## **SECTION - II**

- Q7)** a) Explain concept of generic programming. [7]  
b) Make use of templates to create an array of integer and float. Sort the array using bubble sorting technique. [10]

OR

- Q8)** a) Make use of function templates to create an array of integer and float. Sort the array using bubble sorting technique. [9]  
b) Explain with example class templates with multiple parameters. [8]

- Q9)** a) What is exception handling? What are the steps for exception handling in C++? Give examples. [7]  
b) Write a program in C++ to create an employee database and store it in a sequential file named emp.dat. make use of structures [10]



OR

- Q10)** a) What are the different modes of file operations in C++. [7]  
b) Write a program in C++ to create an patient database and store it in a sequential file named patient.dat. make use of structures. [10]

- Q11)** a) What is exception handling? Compare exception handling mechanism in C++ and Java. [8]  
b) Explain four features of Java [8]

OR

- Q12)** a) What is the difference between class and interface? Give example for use of interfaces in inheritance. [6]  
b) State and explain different access specifiers in Java. [4]  
c) Explain different uses of keyword Final with example. [6]



P1093

[4066] - 44

**S.Y. M.C.A. (Engineering)**  
**ORGANIZATION BEHAVIOR**  
**(2005 Course) (Sem. - IV) (215012) (Theory)**

*Time : 3 Hours]*

*[Max. Marks :100*

*Instructions to the candidates:-*

- 1) *All questions are compulsory.*
- 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) i) Explain in brief custodial and supportive Model of Organizational Behavior. [8]
- ii) Explain motivation process along with content and process model of motivation. [8]

OR

- b) i) Define Organization Behavior and list the key elements in OB. [8]
- ii) Explain in detail Goal setting and Reward system. [8]

- Q2)** a) i) Explain Maslow's Model of Need Hierarchy. [10]
- ii) Define stress and explain in detail causes of stress. What are the ill effects of stress on human ? [8]

OR

- b) i) Explain Conflict frustration? Explain the different types of motives? [10]
- ii) Explain the relationship of Morale to Productivity. [8]

- Q3)** a) i) Write short note on : [16]
- I) Human Resource Planning.
- II) Team Effectiveness.
- III) Performance Appraisal
- IV) Types of groups.

*P.T.O.*

OR

- b) i) Explain how to handle levels of conflicts within an organization. [8]
- ii) Distinguish between Formal & Informal Groups. [8]

**SECTION - II**

- Q4)** a) i) Explain Fielder's Contingency Model of leadership. [8]
- ii) Write Short Note on : [10]
    - I) Leadership style.
    - II) Organizational Structure.

OR

- b) i) Write Short Note on : [12]
    - I) Life Cycle Theory.
    - II) Organizational Design.
  - ii) Explain Hersey and Blanchard's theory. [6]
- Q5)** a) i) What are the constructive conflicts and what are the strategies for conflict resolution. [8]
- ii) Explain conflict process with an example. [8]

OR

- b) i) Write Short Note on : [8]
  - I) Responses to Change.
  - II) Conflict Management.
- ii) Explain the situation when change is accepted in an organization. [8]

- Q6)** a) i) Write Short Note on : [16]
- |                              |                    |
|------------------------------|--------------------|
| I) T.Q.M                     | II) Re-engineering |
| III) Various quality aspects | IV) Benchmarking   |

OR

- b) i) What is Total Quality management? Which are the benefits of TQM? [8]
- ii) Explain Downsizing. Why VRS is said to be effective tool for Downsizing of the Organization? [8]



[4066] - 202

P1096

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

DATA STRUCTURES & FILES

(2008 Course) (Sem. - II) (510910)

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 ADT? Write an ADT for addition & multiplication of two rational numbers. [7]
- b) What is sparse matrix? What are the advantages of writing the sparse matrix representation over the conventional representation of any matrix as 2D array of size  $M \times N$ ? [5]

OR

- Q2)** a) Explain array in detail with column & row major implementation & address calculation in both the cases. [6]
- b) Write a C function to generate Fibonacci series using arrays. [6]

- Q3)** a) Represent the addition of following polynomial using singly linked list. (Clearly show the node structure)
- i)  $P(X) = 5X^6 - 5X^4 - 3X^3 + 4$  &  $Q(X) = 8X^7 + 5X^6 + 3X^5 - 5X^3 + 10X$ .
- ii)  $P(X) = 10X^3 + 5X^2 + 15X - 20$  &  $Q(X) = 7X^4 + 10X^3 + 12X + 30$ . [6]
- b) List advantages of representing linear data structures using linked over sequential organization. [6]

OR

- Q4)** a) Write the steps in Pseudo C code to insert an item into circular linked list. (Give the pictorial representation). [7]
- b) Explain Doubly linked list with example. [5]

- Q5)** a) Conver the following infix expression into postfix.  
 i)  $A + (B * C - (D / E \uparrow F) * G) * H$   
 ii)  $(A + B \uparrow D) / (E - F) + G$  [4]  
 b) Given an ADT for queue. Write a program for queue in C using array implementaion. [7]

OR

- Q6)** a) Write an algorithm & Pseudo C code for factorial of a given number using recursion. [6]  
 b) Write the difference between linear queue & circular queue. [5]

### SECTION - II

- Q7)** a) Write Dijkstra Algorithm to find the shortest path in a graph. [6]  
 b) How do represent graph using adjacency matrix? [5]

OR

- Q8)** a) Explain Binary Search Tree with different tree traversal techniques. [6]  
 b) Write an algorithm for conversion of general tree to binary tree. [5]

- Q9)** a) Write an algorithm & Pseudo C code for Binary Search to search given number in an array. [6]  
 b) Explain the following with respect to sorting [6]  
 i) Sort stability. ii) Sort passes.  
 iii) Sort efficiency.

OR

- Q10)** a) Write a Pseudo 'C' code routine to sort the following numbers using quick sort. [8]  
 Show all passes to sort the values in ascending order:  
 56, 12, 84, 56, 28, 0, -13, 47, 94, 31, 12, -2  
 b) Compare sequential & binary search methods. [4]

- Q11)** a) Write a note on Hashing. [6]  
 b) Explain indexed sequential file organization. [6]

OR

- Q12)** Explain collision resolution techniques in hashing. [12]



**P1055**

**[4066]-205**

**First Year M.C.A. (Engineering Faculty)  
MANAGEMENT INFORMATION SYSTEMS  
(2008 Pattern) (510913) (Sem. - 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) *From Section I. Answer (Q1 or Q2) and (Q3 or Q4) and (Q5 or Q6)*
- 4) *From Section II. Answer (Q7 or Q8) and (Q9 or Q10) and (Q11 or Q12)*
- 5) *Neat diagram must be drawn wherever necessary.*
- 6) *Make suitable assumptions wherever appropriate and relevant.*

**SECTION - I**

- Q1)** a) Describe in detail the Information Systems (IS) hierarchy. [6]  
b) What is corporate planning? Explain the essentiality of strategic planning. [6]

OR

- Q2)** a) Explain the various levels of management. [6]  
b) Explain the various types of information systems. [6]
- Q3)** a) What is personal management? What are its objectives? [6]  
b) Explain in detail Transaction Processing Systems as an application of Management Information Systems. [6]

OR

- Q4)** a) Explain the applications of Management Information Systems (MIS) in: [6]  
i) Production management.  
ii) Insurance sector.  
b) Explain cross-functional enterprise systems. What are its benefits? [6]
- Q5)** a) Explain Voice BPO and non-voice BPO. What are the challenges in Business Process Outsourcing (BPO) management? [6]  
b) What are the steps in Business Process Re-engineering? Explain. [5]

OR

- Q6)** a) Explain the steps in Enterprise Resource Planning (ERP) implementation. What are the benefits of Enterprise Resource Planning (ERP) solutions? [6]
- b) What is call center? What are the different activities performed in call centers? [5]

**SECTION - II**

- Q7)** a) Explain the concept of electronic payment processes. [6]
- b) Write a short note on - Supply Chain Management (SCM). [6]

OR

- Q8)** a) Explain B2B, B2C and C2C types of e-Commerce. [6]
- b) Write short notes on following : [6]
- i) Three phases of Customer Relationship Management.
- ii) e-Commerce applications.

- Q9)** a) What is Data Warehouse? Mention steps involved in implementation of a Data Warehouse. [6]
- b) Write short notes on following : [6]
- i) Executive Information systems.
- ii) Artificial Intelligence systems.

OR

- Q10)** a) Explain the various analysis methods in decision support system. [6]
- b) Explain with the neat diagram, various components and interconnects of an expert system. [6]
- Q11)** a) What is disaster recovery plan? Explain steps involved in developing a disaster recovery plan. [6]
- b) List and briefly explain, the issues involved in global management of information technology. [5]

OR

- Q12)** a) Explain the following : [6]
- i) Cyber theft.
- ii) Software Piracy.
- b) Explain the ethical responsibility of Business Professionals. [5]

Total No. of Questions : 12]

[Total No. of Pages : 2

**P1056**

**[4066]-502**

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

**COMPUTER GRAPHICS**

**(2008 Pattern) (710902) (New) (Sem. - 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 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.*
- 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 different character generation techniques. [6]  
b) Explain DDA algorithm for circle drawing. [6]

OR

- Q2)** a) What is aliasing? Explain any two antialiasing techniques. [6]  
b) Explain the following : [6]  
i) Frame buffer.  
ii) Vectors.  
iii) Aspect ratio.

- Q3)** a) Explain the different methods for testing a pixel inside of polygon. [6]  
b) Explain the following polygon filling algorithm. [6]  
i) Seed fill.  
ii) Edge-fill.

OR

- Q4)** a) Explain inverse transformation and derive the matrix for inverse transformation. [6]  
b) Describe with respect to 2D transformation. [6]  
i) Scaling.  
ii) Rotation.  
iii) Translation.

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



- Q5)** a) Why is segment used? How it is implemented using different data structures? [5]  
b) Describe Sutherland Hodgman polygon clipping algorithm. State its limitations. [6]

OR

- Q6)** a) What are the advantages of using segmented display file? Explain with example the functions needed to maintain a segmented display file. [6]  
b) Explain Cohen Sutherland outcode algorithm for line clipping. [5]

### **SECTION - II**

- Q7)** a) Give the classification of perspective projection and compare parallel projection. [6]  
b) Rotate object about z axis such that x-axis passes through a point P ( $x_p, y_p, 0$ ) in x – y plane. [6]

OR

- Q8)** a) What is the necessity for 3-D clipping and windowing algorithm? Explain any one 3-D clipping algorithm. [6]  
b) Explain 3-dimensional transformation matrices for [6]  
i) Translation.  
ii) Scaling.  
iii) Rotation about X, Y, Z axis.

- Q9)** a) How does Z buffer algorithm determine which surfaces are hidden? [6]  
b) Compare RGB and HSV color model. [6]

OR

- Q10)** a) Explain Warnock's algorithm for hidden line removal. [6]  
b) Explain Gouraud Shading and Phong Shading. [6]

- Q11)** a) Explain curve generation with example. [6]  
b) Explain real time animation. [5]

OR

- Q12)** a) What is fractal dimension? Explain how fractal surfaces are generated? [6]  
b) Explain the procedural method for controlling animation. [5]



Total No. of Questions : 12]

[Total No. of Pages : 2

**P1057**

**[4066]-505**

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

**SOFTWARE TESTING**

**(2008 Pattern) (710905) (Elective - II) (Sem. - V) (New)**

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

**SECTION - I**

- Q1)** a) What is Software Testing? Discuss four principles of Investigation in details. [6]  
b) Compare measurement scales types : Nominal, Ordinal, Interval, Ratio and Absolute scales. Give examples from software field. [6]

OR

- Q2)** a) Define terms indirect measure and validating a prediction system. [4]  
b) What is Cyclomatic Complexity? Where and how it is used? [8]
- Q3)** a) What is good data? How to collect data and define data? [5]  
b) Write a short note on : [6]  
i) COCOMO-II.  
ii) Albrecht's Approach.

OR

- Q4)** a) Explain in details Halstead's Software Science. [5]  
b) Write a short note on : [6]  
i) Verification.  
ii) Validation.
- Q5)** a) What are the different types of Structural Measures? [6]  
b) Explain different metrics used in Object Oriented methodology. [6]

**P.T.O.**

OR

- Q6)** a) Explain Defect Life Cycle in brief. [4]  
b) Define terms : [8]  
i) Defect classes.  
ii) Defect.  
iii) Faults.  
iv) Errors.

**SECTION - II**

- Q7)** a) What is Test Plan? What are different Components in Test Plan? [4]  
b) What is Testing Defects? Explain in brief Defect Classes & Defect Repository Metrics works? [8]

OR

- Q8)** a) What is Acceptance Testing? Explain in brief types of Acceptance Testing. [6]  
b) What is Integration Testing? What are its types? Explain in brief. [6]
- Q9)** a) What is Test Summary Report? [6]  
b) What is Static Testing? Explain in brief types of Static Testing. [5]

OR

- Q10)** a) What is Automation Testing? What is difference between Manual Testing and Automation Testing? [6]  
b) Explain in brief the steps involved in problem reporting phase. [5]
- Q11)** a) What are obvious usage errors and how can be they eliminated? [6]  
b) What is Structural Testing? What are different types of Structural Testing? [6]

OR

- Q12)** Write short note on : [12]  
a) Logistics and Tooling.  
b) Regression Testing.  
c) Validation Testing.  
d) Ad hoc Testing.



**P1065**

**[4066] - 24**

**F.Y. M.C.A. (Engineering Faculty)  
MICROPROCESSOR APPLICATIONS  
(2005 Pattern) (Sem. - II) (115012)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** a) Draw and explain the functional block diagram of 8085. [10]

b) Design a system to interface 8KB SRAM to 8085 microprocessor. [8]

OR

**Q2)** a) Explain all the pins' functions in 8085. [10]

b) What is the requirement of latches and buffers in 8085 system?  
Elaborate. [8]

**Q3)** a) Write an 8085 assembly language program to convert 4-digit BCD number into equivalent HEX. [8]

b) What is the support of 8085 to communicate with slow peripherals? [8]

OR

**Q4)** a) Draw and explain the timing diagram for the instruction LXI H,2300H. [8]

b) Explain all addressing modes of 8085. [8]

**Q5)** a) Draw an Interfacing diagram to interface 16 key keypad using 8255. [8]

b) Explain BSR mode of 8255 in detail. [8]

OR

**Q6)** a) Compare Memory mapped I/O and I/O mapped I/O. [4]

b) Draw and explain functional block diagram of 8255. [8]

c) Write a note on Polled I/O. [4]

**P.T.O.**

## SECTION - II

**Q7)** a) Explain execution of any RST instruction in 8085. Elaborate with diagram. [8]

b) Draw and explain the functional block diagram of 8259. [8]

OR

**Q8)** a) What is 2-key lock out and N-key roll over? Write the features of 8279. [8]

b) Explain Mode 3 and 4 of 8253 in detail. [8]

**Q9)** a) Explain synchronous mode operation of 8251. [8]

b) Which are the serial communication instructions in 8085? Explain with example. [8]

OR

**Q10)** a) What is the need of DMA? Explain the concept with neat diagram. [10]

b) Compare synchronous and asynchronous mode operation of 8251. [6]

**Q11)** a) Draw the programmers model of 8086. Explain in detail. [10]

b) Explain Maximum mode operation of 8086. [8]

OR

**Q12)** a) How does even and odd memory banks are managed in 8086 based system? [10]

b) Write 8086 assembly language program to count 8 bit negative numbers in an array. [8]



**[4066] - 25**

**F.Y. M.C.A. (Engineering Faculty)  
MANAGEMENT INFORMATION SYSTEM  
(2005 Pattern) (Sem. - II) (115013)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *Draw neat diagrams wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Solve 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 and Q.11 or Q.12 from Section II.*

**SECTION - I**

- Q1)** a) Define system. With the help of a simple block diagram explain the working of a system. State the need and importance of feedback. [12]  
b) Differentiate between an open system and closed system. [6]

OR

- Q2)** a) What is a data model? With a suitable sketch explain logical data model elements. [8]  
b) List and explain the major functions of management. [10]

- Q3)** a) Discuss various reports that are handled by personnel management department. [8]  
b) Explain how MIS can be employed in an Airlines sector. [8]

OR

- Q4)** a) Describe various factors supporting MIS in service industry. [8]  
b) Explain the change management process. [8]

- Q5)** a) Define EMS. Explain functions of EMS components. [8]  
b) Explain in brief the standard ERP modules. [8]

OR

- Q6)** a) Explain process model of an organization. [8]  
b) State and explain various factors to be considered while outsourcing. [8]

**P.T.O.**

## SECTION - II

- Q7)** a) Define CRM. Explain the important components of CRM. [12]  
b) State benefits and challenges of CRM. [6]

OR

- Q8)** a) Explain briefly various components of SCM. [12]  
b) Compare B2B and B2C e-commerce. [6]

- Q9)** a) Discuss the role of analytical modeling in DSS. [8]  
b) Explain steps involved in implementation of a data warehouse. [8]

OR

- Q10)** a) With the help of a diagram explain various components of an expert system. State the important applications of expert system. [8]  
b) Explain the following in brief: [8]  
i) Executive information system.  
ii) Geographic information system.

- Q11)** a) Explain ethical and social aspects involved in implementation of MIS. [8]  
b) Discuss in brief various tools of security management. [8]

OR

- Q12)** Discuss following issues involved in global management of IT : [16]  
a) Cultural and political challenges.  
b) Transnational strategies.  
c) Geo-economic challenges.  
d) Data access issues.



**P1068**

**[4066] - 31**

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

**OPERATING SYSTEMS**

**(2005 Pattern) (215001) (Sem. - III)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

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

**SECTION - I**

- Q1)** a) Define an assembler, how does an assembler work? Explain the working of an assembler with supportive block diagram. [6]
- b) Explain the fundamentals of language processing. [6]
- c) Differentiate between a compiler and an interpreter with proper examples. [6]

OR

- Q2)** a) Explain the concept of a cross-assembler and any 3 features of MASM in brief. [6]
- b) Explain the organization for a single pass assembler in detail. [6]
- c) What is a macro? Explain the model of a macro processor. [6]

- Q3)** a) Define a loader. Give the importance of a loader. [4]
- b) Describe any 4 schemes of loaders in detail. [8]
- c) Explain the concept of Linking and debugging. [4]

OR

- Q4)** a) Explain the concept of parsing and name any 2 parsing techniques. [4]
- b) Explain all the phases of compilers in detail. [8]
- c) Why is the phase of Lexical analysis important? Why is input buffering important in Lexical Analysis? [4]

**P.T.O.**



- Q5)** a) Explain any 4 functions of an operating system in brief. [4]  
b) Write short notes on :- [8]  
i) Batch processing systems with examples.  
ii) Time sharing systems with examples.  
c) Define the following terms:- [4]  
i) Program  
ii) Multiprocessing  
iii) Task  
iv) Thread.

OR

- Q6)** a) Define process scheduling, also name any 2 scheduling algorithms. [4]  
b) Write short notes on :- [8]  
i) Layered structure  
ii) Kernel based structure.  
c) What are the different scheduling criteria for scheduling algorithms. [4]

### SECTION - II

- Q7)** a) What are the different aspects of memory management? [6]  
b) Differentiate between contiguous and non-contiguous memory allocation. [6]  
c) Explain segmentation in detail. [6]

OR

- Q8)** a) What is the concept of Virtual Memory? Explain concepts of logical and physical addresses. [6]  
b) Explain the following with respect to memory management. [6]  
i) Swapping  
ii) Fragmentation  
iii) Compaction.  
c) Explain :- [6]  
i) Best Fit allocation algorithm  
ii) First Fit allocation algorithm.

- Q9)** a) Explain any 3 characteristics of I/O devices. [6]  
b) Explain the following: - [6]  
i) A file  
ii) Record  
iii) A Directory structure  
c) Describe the basic I/O organization. [4]

OR

- Q10)** a) How does Direct Memory Access [DMA] increase system concurrency?  
How does it complicate the hardware design? [6]  
b) Explain any 3 file access methods. [6]  
c) Explain the concept of file protection. What are the different accesses  
rights given to a file? [4]

- Q11)** a) Explain the following components of a Linux system. [6]  
i) Kernel  
ii) System libraries  
iii) System utilities.  
b) What is a system call? What is a system command? [4]  
c) What are the 2 major functionalities of a Linux Kernel? [6]

OR

- Q12)** a) Differentiate between Linux, Unix, and windows OS. [6]  
b) Draw and explain the basic Linux file system organization. [4]  
c) Explain the concept of a Virtual File System in Linux with example. [6]



**P1069**

**[4066]-32**

**S.Y. M.C.A. (Engineering Faculty)  
DATABASE MANAGEMENT SYSTEMS  
(2005 Course) (215002) (Sem. - III)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*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) Your answers will be valued as a whole.*
- 5) Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Describe the five components of the DBMS environment and discuss how they are related to each other. **[7]**
- b) Explain the difference between two-tier and three tier client/server architecture. **[6]**
- c) Discuss each of the following terms : **[4]**
- i) Data.
  - ii) Meta Data.
  - iii) Database.
  - iv) Database Management System.

OR

- Q2)** a) Discuss the concept of data independence and explain its importance in a database environment. **[7]**
- b) How the following problems are handled by a DBMS : **[6]**  
Data redundancy and inconsistency, data isolation, data integrity.
- c) Compare relational and hierarchical data models w.r.t. **[4]**
- i) Data element organization.
  - ii) Relationship organization.
  - iii) Identity.
- Q3)** a) Construct an E-R diagram for a car-insurance company whose customers own one or more cars each. Each car has associated with it zero to any number of recorded accidents. **[6]**

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

- b) Explain with example how E-R diagram is converted into tables. [6]
- c) We can convert any weak entity set to a strong entity set by simply adding appropriate attributes. Why, then, do we have weak entity sets?[5]

OR

- Q4)**
- a) Explain the concept of generalization and aggregation with suitable example. [6]
  - b) What is the difference between a primary key and a candidate key? Explain what is meant by a foreign key? How do a foreign key of a relation is related to candidate keys? [6]
  - c) Discuss the properties of a relation. [3]
  - d) Explain the distinction between total and partial constraints. [2]
- Q5)**
- a) Explain with example the concept of referential integrity. Also discuss the situation when referential integrity constraint is violated by insert, delete and update operations on the relation. [8]
  - b) What are the advantages and disadvantages of SQL? [6]
  - c) List two reasons why null values might be introduced into the database.[2]

OR

- Q6)**
- a) How to perform database updates using INSERT, UPDATE and DELETE. Justify your answer. [6]
  - b) Explain how the GROUP BY clause works. What is the difference between the WHERE and HAVING clauses? [6]
  - c) What is a sub query? Give suitable examples. [4]

### SECTION - II

- Q7)**
- a) Explain following statements : [10]
    - Declare cursor.
    - Open.
    - Fetch.
    - Close.
    - Rowtype.
  - b) Write an SQL trigger to carry out the following action : On **delete** of an account, for each owner of the account, check if the owner has any remaining accounts, and if he/she does not, delete his/her record from the *depositor* relation. [7]

OR

- Q8)** a) Consider Question No.3 (a) for a database and construct the following SQL queries to
1. Find the total number of people who owned cars that were involved in accidents in 1989.
  2. Find the number of accidents in which the cars belonging to “John Smith” were involved.
  3. Add a new accident to the database; assume any values for required attributes.
  4. Delete the Mazda car belonging to “John Smith”.
  5. Update the damage amount for the car with license number “AABB2000” in the accident with report number “AR2197” to \$3000. **[10]**
- b) Write a short note on : ODBC **[4]**
- c) Describe the circumstances in which you would choose to use embedded SQL rather than SQL alone or only a general-purpose programming language. **[3]**
- Q9)** a) What are the desirable properties of a decomposition? Explain. **[8]**
- b) The closure set F of functional dependencies for relation schema  $R = (A, B, C, D, E)$  is **[6]**
- A - > BC
- CD - > E
- B - > D
- E - > A
- List candidate keys for R
- c) What are the types of anomalies in a database? **[3]**

OR

**Q10) a)** Normalize the following relation upto 3NF **[10]**

**Sales Order**

*Fiction Company  
202 N. Main  
Mahattan, KS 66502*

Customer Number :	1001	Sales Order Number :	405
Customer Name :	ABC company	Sales Order Date :	2/1/2000
Customer Address :	100 Points Manhattan, KS 66502	Clerk Number :	210
		Clerk Name :	Martin Lawrence

Item Ordered	Description	Quantity	Unit Price	Total
800	widgit small	40	60.00	2,400.00
801	tingimajigger	20	20.00	400.00
805	thingibob	10	100.00	1,000.00
Order Total				3,800.00

- b) Show that, if a relation schema is in BCNF, then it is also in 3NF. **[5]**
- c) What is Fully Functional dependency? **[2]**

**Q11) a)** Write a short note on :

- i) Concurrency control protocols.
- ii) Recovery techniques. **[8]**
- b) What is a dead lock? How it can be prevented? How to recover if a deadlock occurs? **[8]**

OR

**Q12) a)** Explain two phase locking protocols with examples. **[8]**

- b) Explain the purpose of checkpoint mechanism. How does frequency of checkpoints affect : **[8]**
  - i) System performance when no failure occurs.
  - ii) The time it takes to recover from a system crash.
  - iii) The time it takes to recover from a disk crash.



**[4066] - 35**

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

**PRINCIPLES OF MULTIMEDIA**

**(2005 Pattern) (215005) (Sem. -III)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answer 3 questions from Section I and 3 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) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 5) *Assume suitable data, if necessary.*

**SECTION - I**

**Q1)** Write the answers of following : **[18]**

- a) What is Multimedia?
- b) Define Multimedia database?
- c) Define frame rate. What are the frame rates of television and movie films?
- d) Define Hypermedia?
- e) What is authoring? Name four products that offer authoring features.
- f) Which animation file formats are best suited for Internet? Why?
- g) Which video broadcasting standards are used currently?
- h) What is the difference between direct and indirect illumination?
- i) What is streaming?

OR

**Q2)** a) Explain multimedia building blocks and its role in development of multimedia mobile applications. **[9]**

b) Define user interface. Explain QT user interface in detail. **[9]**

**Q3)** a) Explain GIF file format in detail. **[8]**

b) Explain Shannon-Feno algorithm of compression with an example. **[8]**

OR

**P.T.O.**

- Q4)** a) What is transform coding? How is it applied to image compression?[8]  
b) What do you mean by image enhancement? Explain how image enhancement is done using Histogram. [8]

- Q5)** a) How audio is captured? Explain components in the audio capturing system. [8]  
b) Explain the format of MP3. [8]

OR

- Q6)** a) Compare VOC and WAV file formats. [8]  
b) What is MIDI? Give the advantages of MIDI sound over digital audio.[8]

### SECTION - II

- Q7)** a) Describe a CD-ROM in terms of [9]  
i) The layers in it.  
ii) Layout of tracks.  
iii) Lands and Pits on it.  
b) Which are the different layers in MPEG? Define and explain I, P and B frames with reference to MPEG. [9]

OR

- Q8)** a) Generate the Huffman encoding tree and codes for the example- Characters A, B, C, D and E have the following probability of occurrence :  $p(A) = 0.16$   $p(B)=0.51$ ,  $p(C)=0.09$ ,  $p(D)=0.13$ ,  $p(E)=0.11$ . [9]  
b) Compare NTSC, PAL and HDTV broadcasting standards. [9]

- Q9)** a) Explain the features of VRML. How the EVENTS and ROUTS are used in VRML justify with proper example? [8]  
b) Explain basic objects in VRML. Write pseudo code for coffee house.[8]

OR

- Q10)** a) Define Virtual Reality? Explain the construction of Head Mounted Displays. [8]  
b) Why does it take four nodes to make simple object in VRML and which are those? [8]



- Q11)** a) Explain different techniques of animation. [8]
- b) Discuss impact and use of : [8]
- i) Interpolation.
  - ii) Parameter Curve editing.
  - iii) Inverse kinematics.
  - iv) Motion Paths in the development of animations.

OR

- Q12)** Answer the following : [16]
- a) Compare 2D and 3D Animation.
  - b) Compare Client pull and Server push in web animation.
  - c) Compare Rendering and Morphing.



**P1071**

**[4066] - 41**

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

**SOFTWARE ENGINEERING - I**

**(Sem. - IV) (2005 Pattern) (215009)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*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) *Assume suitable data, if necessary.*
- 5) *Figures to the right indicate full marks.*

**SECTION - I**

- Q1)** a) Explain with neat diagram the prototyping model for software development what are applied throughout the software process. [8]  
b) Explain in detail all the levels of CMMI with key process area. What is Process Assessment? Explain with suitable diagram? [9]

OR

- Q2)** a) What are the advantages of iterative development? Compare iterative development with Incremental delivery approach. [8]  
b) What is software component? What is component based .software development? What are the issues to be considered in selection and usage of components? [9]

- Q3)** a) What is the importance of principles and practices in software engineering? Explain in detail coding principles and concepts. [8]  
b) What are the factors considered while performing system modeling? Explain with a suitable example how systems simulation is useful aspect while designing the system. [9]

OR

- Q4)** a) With a neat example and diagram explain Hatley-Pirbhai modeling. What is the role of architecture flow diagram in developing system flow diagram. [8]  
b) How system modeling is achieved using UML. What is the purpose of activity diagram? [9]

**P.T.O.**

- Q5)** a) Explain in detail, Class Responsibilities Collaborator (CRC) modeling? [8]  
b) What are the goals of Requirement Engineering? What are the tasks performed in requirement engineering? [8]

OR

- Q6)** a) What is Behavior Modeling? Draw a sequence diagram for at least two scenarios for account holder Transaction with Bank. Assume suitable scope and indicate it. [8]  
b) Explain the need of requirement prioritization? How the requirements are prioritized? [8]

## SECTION - II

- Q7)** a) Explain modularity, Refinement and Re-factoring in Software design process. [8]  
b) What is the importance of software design? What is the relation between analysis and design? [9]

OR

- Q8)** a) Define Architectural Design. Explain First level factoring and second level factoring in Architectural Designs. [8]  
b) What are the golden rules of interface design? Explain in detail all the rules. [9]

- Q9)** a) What is fault-Based testing? What is meant by testing surface structure and Deep structure? [8]  
b) What are strategic issues in software testing? Explain in detail? [9]  
i) Top-down integration testing.  
ii) Bottom-up integration testing.

OR

- Q10)** a) Compare : [8]  
i) White Box testing and Black Box testing.  
ii) Verification and Validation.  
b) What are strategic issues in software testing? [9]

- Q11)** a) What do you mean by the term : measure, measurement and metrics. List and measurement process activities. What are the attributes of effective software metric. List the metric for analysis and design model. [8]
- b) What is the importance of conformance, standards and measurements in context of software quality? [8]

OR

- Q12)** a) What are the objectives of software Maintenance? Explain in detail maintenance metrics. [8]
- b) Explain in detail function point metric. List all the value adjustment factors. What are the metric for specification quality? [8]



**P1073**

**[4066] - 43**

**S.Y. M.C.A. (Faculty of Engineering)  
OBJECT ORIENTED MODELING & DESIGN  
(Sem. - IV) (2005 Pattern) (215011) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*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 object oriented features? [6]  
b) Write a short note on CORBA services. [6]  
c) Explain in brief new features of UML 2.0. [5]

OR

- Q2)** a) Write a short note on Rational Unified Process. [6]  
b) What is 4+1 architecture view? Describe advantages of focusing on each of the view of the system. [6]  
c) Describe XML metadata interchange in brief. [5]

- Q3)** a) Write short notes on [6]  
i) Actors.  
ii) Use case.  
b) How to use OCL? Explain with relative examples [6]  
c) Write a short note on “Extensibility mechanism in UML”. [5]

OR

- Q4)** a) What is generalization? Explain with example. [6]  
b) Explain polymorphism and encapsulation with example. [6]  
c) Explain stereotypes and tagged values with example. [5]

**P.T.O.**

- Q5)** a) Explain how you use associations in use case diagram. [4]  
b) An Event Management System for a college is supposed to perform following functionalities. [12]  
i) Finance Management.  
ii) Volunteer Management.  
iii) Schedule Management / Sub events management.  
iv) Participant's management etc.

Draw a Use case diagram by making certain assumptions for extension and inclusion of use cases.

OR

- Q6)** a) What is use case scenario? Explain with example [4]  
b) Draw a class diagram for Inventory management system. Assume appropriate scope of the system. [12]

### SECTION - II

- Q7)** a) Explain with example timing constraint used in a sequence diagram. [6]  
b) What is the purpose of sequence diagram. Compare sequence and communication diagram in four counts namely Visual emphasis, freedom to represent objects information, the way Sequencing is shown, the way iteration/looping is shown. [6]  
c) What are different interaction diagrams? [5]

OR

- Q8)** a) Draw sequence diagram for the following scenarios : [12]  
i) Adding contacts in Mobile.  
ii) Searching for a contact in Mobile and calling your friend on Mobile.  
b) Explain swimlanes with example. [5]

- Q9)** a) Explain concepts and notation through simple examples for following Terms in UML. [5]  
i) Action.  
ii) Concurrent states.  
b) Draw an activity diagram for arranging the college orchestra in your annual gathering. [12]

OR

- Q10)** a) Draw state transition diagram for tea/coffee vending machine where the user selects item (tea/coffee) by pressing the appropriate button. Then user inserts coin according to the price of item. Machine returns the coin if it is not the appropriate one. Machine will dispense the item after detecting cup below the dispenser. If cup is not present after waiting for 30 secs, the request is cancelled and coin is ejected. If sufficient coffee/tea/milk powder or water is not there, the machine will make alarm. [12]
- b) Compare concepts: state and activity. [5]

- Q11)** a) Explain how UML is useful in embedded systems. [6]
- b) Draw a deployment diagram for full fledged website to be hosted for airline reservation system. Make suitable assumptions. [10]

OR

- Q12)** a) What are the UML commercial applications? [4]
- b) Draw component diagram for library system [12]



**P1074**

**[4066] - 51**

**T.Y. M.C.A. (Engg. Faculty)**

**PRINCIPLES AND PRACTICES FOR IT MANAGEMENT**

**(Sem. - V) (2005 Course) (315001)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Write three questions from each section.*
- 2) *Write the answers to each section in separate answer book.*
- 3) *Assume suitable data, if necessary.*
- 4) *Draw figures and tables as required.*
- 5) *Figures to the right indicate full marks.*

**SECTION - I**

**Unit - I**

- Q1)** a) Justify, how management is an Art, Science and Profession? [8]  
b) What is strategic management? Explain different techniques adopted for strategic planning? [9]

OR

- Q2)** a) What are business ethics and social responsibilities of a business Explain in detail. [8]  
b) Explain the role and responsibilities of a manager in business operations. What skill set a manager must possess? [9]

**Unit - II**

- Q3)** a) How to set the priorities of any project? What are the different factors, which affects the project priorities? [8]  
b) Risk management is significant in planning of the project. Justify. [9]

OR

- Q4)** a) Explain Work Breakdown Structure (WBS) in project. What are benefits of WBS? [8]  
b) Risk assessment and risk monitoring is justified in almost all projects. How? [9]

**P.T.O.**



### Unit - III

- Q5)** a) What are the steps involved in resource procurement and purchase? Explain in detail. [8]
- b) How PERT and CPM helps to schedule and track the projects? Explain in brief. [8]

OR

- Q6)** a) Revision and change are the natural phenomena in projects. What is the need for revision and how the changes in the projects are controlled? [8]
- b) What are the different team issues involved in organizing and creating a team? Explain in detail. [8]

### SECTION - II

#### Unit - IV

- Q7)** a) What are different theories of group formation? Explain in detail. [8]
- b) What are the reasons of conflicts in a team? How to handle the conflict, without disturbing the role of the members? [9]

OR

- Q8)** a) How to resolve conflicts and stress among the group members? Explain in detail. [8]
- b) What are different aspects of energy management? Explain the process of energy audit in organization. [9]

#### Unit - V

- Q9)** a) What is Supply Chain Management (SCM) system? How modern business is benefited through SCM? [8]
- b) Write notes on followings : [9]
- i) Knowledge management
  - ii) Intellectual property rights
  - iii) Learning organization

OR

- Q10)** a) What is different Intellectual Property Rights (IPR)? How IPR helps organizations to protect their innovations and research? [8]
- b) Write notes on following : [9]
- i) Supply chain management system
  - ii) Cyber crimes and Cyber laws
  - iii) Six Sigma

**Unit - VI**

- Q11)** a) Explain different stake holders of business management system in area of Finance and Accounting. How Information system or Information technology helps business to deal with their stake holders? [8]
- b) What are different benefits an organization avails with the help of IT tools and techniques to improve the business outcome? [8]

OR

- Q12)** a) Explain different stake holders of business management system in area of Health Care and Life Insurance. How Information system or Information technology helps business to deal with their stake holders? [8]
- b) How IT tools and techniques improve the modern business outcome? Explain in detail. [8]



**[4066] - 52**

**T.Y. M.C.A. (Engg. Faculty)**

**COMPUTER GRAPHICS**

**(2005 Pattern) (315002) (Sem. - V)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate answer books.*
- 2) *In Section I attempt Questions Nos. 1 or 2, 3 or 4, 5 or 6 and in Section II questions Nos. 7 or 8, 9 or 10, 11 or 12.*
- 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 architecture of raster display and compare raster scan and vector scan display. **[8]**
- b) Explain Bresenham's line drawing algorithm. **[6]**
- c) Explain what is mean by resolution of an image and an image's aspect ratio. **[3]**

OR

- Q2)** a) Explain the DDA line algorithm with its advantages and disadvantages. Also rasterize the line (0,0) to (-7,-7). **[9]**
- b) Write a short note on following : **[8]**
- i) Anti aliasing
  - ii) Data generating devices.

- Q3)** a) Explain scan line conversion algorithm with suitable example. **[10]**
- b) Prove that scaling operations commute. **[7]**

OR

- Q4)** a) Explain and compare seed-fill and edge-fill algorithm for polygon. **[8]**
- b) What is homogeneous coordinate system? Give the homogenous representation matrix for rotation about x-axis and y-axis. **[9]**

**P.T.O.**

- Q5)** a) Explain midpoint sub-division algorithm in detail. [8]  
b) What is Segment? Explain Segment Table and how to perform delete operation on segment. [8]

OR

- Q6)** a) Explain polygon clipping algorithm. Comments on whether the line clipping algorithm is directly applied to a polygon or not. [10]  
b) Explain interior and exterior clipping. [6]

**SECTION - II**

- Q7)** a) Explain the 'parallel and perspective projection with its types. [10]  
b) Explain with example, 3D viewing transformation. [7]

OR

- Q8)** a) Explain any one 3D clipping algorithm. [9]  
b) Write a short note on 3D-geometry and its primitives. [8]

- Q9)** a) Explain Back face removal algorithm. [9]  
b) Write short note on : [8]  
i) Shading algorithm  
ii) Binary Space partitioning trees

OR

- Q10)** a) Discuss Painter's algorithm and how is the depth of the polygon determined by the Painter's algorithm. [9]  
b) Discuss about the characteristics of the following illumination parameters. [8]  
i) Diffuse  
ii) Specular Reflection.

- Q11)** a) Explain different mechanism to generate a curves. [6]  
b) Define Fractals & Fractal Lines. Explain how fractals are used to generate fractal surfaces. [10]

OR

- Q12)** Write a short note on the following : [16]  
a) Fractal surfaces  
b) Bezier Curve  
c) Graphics Kernel System(GKS)  
d) Frame by Frame animation



**[4066] - 54**

**T.Y. M.C.A. (Engg. Faculty)**

**SOFTWARE TESTING**

**(2005 Pattern) (Elective - I) (315004(A)) (Sem. - V) (Theory)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*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) *Figures to the right indicate full marks.*
- 5) *Use of logarithmic tables slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 6) *Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Give the classification of software measures. **[8]**  
b) What is a good data? How to store and extract data? **[8]**

OR

- Q2)** a) Explain measurement scales and different scale types. **[8]**  
b) Define i) Measurement ii) Entity iii) Attribute **[8]**

- Q3)** a) Which are the difficulties with general complexity measures. **[8]**  
b) Explain different types of structural measures. **[8]**

OR

- Q4)** a) Explain following terms :  
i) Modularity. **[3]**  
ii) Morphology. **[3]**  
iii) Information flow. **[2]**  
b) What are the notations used in control flow structure for various programming constructs. Draw control flow graph for any search algorithm. **[8]**

- Q5)** a) Define the term 'Defect' & Explain Defect life cycle. **[8]**  
b) Enumerate all components of a test plan. Explain the execution of test plan in detail. **[10]**

OR

**P.T.O.**

- Q6)** a) Explain developer / tester support for defect repository. [8]  
b) Differentiate between fault, defect, bug, failure, anomaly and error. [6]  
c) List different metrics used for defect prevention. [4]

**SECTION - II**

- Q7)** Write a short note on (any three) : [18]  
a) Requirement based testing.  
b) State base testing.  
c) Code Review.  
d) Code Walk through.

OR

- Q8)** a) Explain equivalence class partitioning and boundary value analysis with suitable example. [10]  
b) State and explain the test case adequacy criteria. [8]

- Q9)** a) Explain in detail what is accepting testing, necessary of acceptance testing, explain if required. [8]  
b) Explain with example GUI Testing. [8]

OR

- Q10)** Write a short note on : [16]  
a) Integration Testing.  
b) Regression Testing.  
c) Unit Testing.  
d) Software Test automation.

- Q11)** a) What do you mean of “problem reporting”? What are various problems and best practices context to this. [10]  
b) Write a short note on “Testing the Shipment Unit”. [6]

OR

- Q12)** a) How one chose the method of fix distribution. [8]  
b) Explain best practices for problem resolution for customer satisfaction. [8]



**[4066] - 57**

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

**HUMAN COMPUTER INTERFACE**

**(2005 Pattern) (Sem. - V) (Elective - II) (315005)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates:*

- 1) *Answers to the two sections should be written in separate books.*
- 2) *Use of logarithmic tables, slide rules and electronic pocket calculator is allowed.*
- 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) Define the following terms in respect of GUI design **[8]**
- i) User focus
  - ii) User tasks
  - iii) Interaction
  - iv) Visual style
- b) Discuss about users tasks and needs which are also important in user interface design. Give suitable example to justify your answer. **[9]**

OR

- Q2)** a) What are different Human Factors that are to be considered while designing the user interface? Explain with the help of suitable examples. **[8]**
- b) What kinds of interface features are to be considered in choosing among user interface building tools? Explain briefly. **[9]**
- Q3)** a) Compare and contrast the graphical user interface and the web user interface. **[8]**
- b) Discuss the importance of organizing screen elements clearly and meaningfully in screen design. **[9]**

OR

**P.T.O.**



- Q4)** a) Briefly write and explain Eight Golden Rules that provide interface design. [8]  
b) Take any real world software as example and explain the following terms on that software. Time to learn, Speed of performance, Rate of errors by users, Retention over time and subjective satisfaction? [9]

- Q5)** a) Explain three pillars of interface design. Draw suitable diagram. [8]  
b) Explain Logical User Centric Interaction Design methodology to implement digital library interface? [8]

OR

- Q6)** a) Explain the guidelines for data display and data entry. [8]  
b) What is the aim of user centered design process? How software engineering tools helps in design of such interfaces? [8]

### **SECTION - II**

- Q7)** a) Explain the role of usability testing in user interface design? [9]  
b) Write short note on i) Virtual organization ii) Item representation sequence [8]

OR

- Q8)** a) What is menu? Explain different types of menus? [6]  
b) What is the coordination by tightly coupled windows. [6]  
c) Explain steps for multiple window design. [5]

- Q9)** a) What is CSCW? Explain any two issues in face-to-face communication for CSCW? [8]  
b) What is group-ware? Explain the organizational factors that can make or break group-ware systems. [9]

OR

- Q10)** a) Compare and contrast paper prototype with screen prototype. Which is more suitable for learning? [8]  
b) What is asynchronous interaction and synchronous distributed interaction in cooperative work. Explain. [9]

- Q11)** a) What is Information Visualization? Explain with example visual-information-seeking rule (Overview first, zoom and filter, then details on demand). [8]
- b) Justify the statement that “dialog between user and system is influenced by the style of the interface”. [8]

OR

- Q12)** a) Explain the role of HCI in multimedia and animating industry. [8]
- b) Explain the issues that are considered in website organization. [8]



**P1101**

**[4066]-402**

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

**WEB TECHNOLOGY**

**(2008 Pattern) (610910) (Sem. - IV)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Figures to the right indicate full marks.*
- 2) *Answers to the two sections must be written in separate answer books.*
- 3) *From Section-I, answer (Q.1 or Q.2) and (Q.3 or Q.4) and (Q.5 or Q.6).*
- 4) *From Section-II, answer (Q.7 or Q.8) and (Q.9 or Q.10) and (Q.11 or Q.12).*
- 5) *Make suitable assumptions wherever appropriate and relevant.*

**SECTION - I**

- Q1) a)** State whether the following are True or false : **[2]**
- i) “Protocol used to monitor and control network devices operates at application layer”.
  - ii) “The transport protocol used by TFTP is UDP”.
- b)** Comment and explain : **[4]**
- i) “All the dissimilar networks must use a common transmission protocol for communication”.
  - ii) “MIME defines mechanism to use character encodings other than ASCII, and 8-bit binary content”.
- c)** What are the major components of a web browser? Draw a neat diagram to explain them. **[6]**

OR

- Q2) a)** What is a bridge? Explain its functions and their types. Explain simple bridge. **[6]**
- b)** What is the “Fat client problem” in 2-tier architecture? Explain how it is solved in 3-tier architecture with an example. **[6]**
- Q3) a)** Write a program to create a web page the displays the output as shown in the fig.1 below : **[8]**
- Define the frameset document **main.html**.

**P.T.O.**

- In the left frame **left.html** document is loaded which contains a link **SHOW TABLE** which when clicked, the respective link opens in the right frame **right.html** document that displays “List of items”.

The screenshot shows a web browser with two frames. The left frame contains a link labeled "SHOW TABLE". The right frame displays a table with the following data:

Item Code	Item name	Price	Discount
01	Pencil	5	1%
02	Pen	20	1.5%
03	Notebook	40	2%
04	Diary	80	2.25%

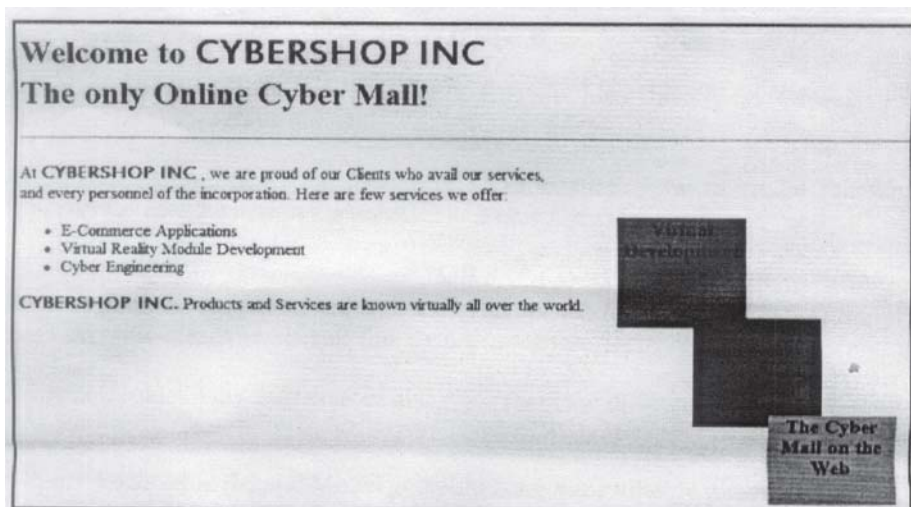
*fig.1*

- b) What is the advantage of document-level style sheets over inline style sheets? What is the format of an external style sheet? [3]

OR

**Q4)** Write a program code for CYBERSHOP INC, using style sheets with the following specifications : [11]

- Define a style class '**.Maxx**' with the following attributes: {font-size: 120%; color: 'green'; font-weight: bold; font-family: cursive}.
- Use the defined style class wherever the text 'CYBERSHOP INC.' appears on the web document.
- Use unordered listing giving the list of services offered by CYBERSHOP INC.
- Define three segments using <DIV>...</DIV> tags with background colors Blue, Green and Goldenrod positioned accordingly with the given text, Obtain an output as shown in fig.2 below :



*fig.2*

- Q5) a)** Write a code to display the following form and add the VBScript to display the Interest when user enters Principal amount, Rate of Interest, No. of Years and clicks on calculate button. (**Interest,  $I = P \times r \times n$** ).[8]

Principal, <i>P</i>	<input type="text"/>	Annual Rate, <i>r</i>	<input type="text"/>
No. of Years ( <i>n</i> )	<input type="text"/>		
Interest, <i>I</i>	<input type="text"/>		
	<input type="button" value="CLEAR"/>		<input type="button" value="CALCULATE"/>

- b) Describe how a web server can be made dynamic. [4]

OR

- Q6) a)** What are the main differences between : [6]
- Servlet and CGI.
  - Procedures Vs Functions.
  - VBScript Vs. JavaScript.
- b) Explain the two kinds of procedures in VBScript with example. [6]

### SECTION - II

- Q7) a)** What is Object Literal in JavaScript? Explain how JavaScript Objects are different from C++/Java objects. [6]
- b) What is Function Object in JavaScript? Demonstrate how to create function objects that uses **Function** Constructor and **new** Operator.[6]

OR

- Q8) a)** Discuss all three approaches to addressing an HTML form element in JavaScript. Also state the disadvantages of first two approaches. [6]
- b) What is Cookie? How it is created and read. Describe difference between Cookie and Session. [6]

- Q9) a)** Describe JSP Model-I and Model-II architecture with suitable diagram. [5]
- b) What is AJAX? Describe Ajax Web Application Model? How it is different from traditional web application model? [6]

OR

**Q10)a)** What is AJAX? Explain how AJAX technology works together to update a part of a page with new data from the server. [8]

b) What is JSP? What are the stages of JSP Life Cycle? Why is JSP preferred over servlets? [3]

**Q11)a)** What is .NET Framework? Explain CLR component with suitable diagram of .NET Framework. [6]

b) How many types of validation controls are provided by ASP.NET?[6]

OR

**Q12)**Write short notes on : [12]

a) XML HttpRequest Object in AJAX.

b) Basic Web control classes.

c) W3C Event Propagation Model.



**P1103**

**[4066]-56**

**T.Y. M.C.A. (Under Faculty of Engineering)  
ENTERPRISE RESOURCE PLANNING  
(2005 Course) (315005) (Sem. - V) (Elective - II)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*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) *Figures to the right indicate full marks.*
- 6) *Assume suitable data, if necessary.*

**SECTION - I**

- Q1)** a) Explain what inside an organization is beyond the scope of an ERP System. **[8]**  
b) Explain the value of an ERP to business. **[9]**

OR

- Q2)** Can we compare ERP system in business with Core Banking System\* used by a bank? Explain the importance of integrated system in business and bank.

\* A Core Banking System is a centralized information system implemented by the bank to provide multiple service delivery channels of ATM, Mobile banking, Internet banking, Point of Sale, Tele-Banking to their customers. **[17]**

- Q3)** a) Explain the role of management in implementing changes in ERP System. **[8]**  
b) Explain the change management necessary for ERP implementation. Explain how to tactfully manage the end user resistance. **[9]**

OR

- Q4)** a) Explain the Organizational requirements for ERP implementation. **[8]**  
b) Explain how the Organizational Culture impacts the ERP implementation. **[9]**

**P.T.O.**

- Q5)** a) What in your opinion is required for successful ERP implementation in an Indian Company? [8]  
b) What are the Critical Success Factors (CSF) for an ERP project? [8]

OR

- Q6)** a) What are the Infrastructure requirements for implementing ERP? [8]  
b) What are the various ERP implementation strategies? [8]

**SECTION - II**

- Q7)** a) Explain the Design and Customization issues for ERP software. [8]  
b) Explain the selection criteria for ERP software. [9]

OR

- Q8)** Compare the implementation ERP system with Off the Shelf and in-house developed ERP packages. Explain the relationship between Off the shelf ERP implementation and ERP failure. [17]

- Q9)** a) What are the issues in Global ERP implementation? [8]  
b) How the Business Process Reengineering (BPR) impacts the ERP implementation? [9]

OR

- Q10)** a) Explain how the E-business support can be integrated with ERP system? [8]  
b) How the ERP can be integrated with CRM, SCM system? [9]

- Q11)** Explain the typical ERP system modules with a brief explanation of each module. [16]

OR

- Q12)** a) Explain the relationship between Finance and Work-In-Progress related module. [8]  
b) Explain the Materials Management and Sales and Marketing modules of ERP. [8]

XXXX



**P1154****[4066] - 33****S.Y. M.C.A. (Engineering Faculty)****FINANCIAL ACCOUNTING****(Sem. - III) (2005 Pattern) (215003)***Time : 3 Hours]**[Max. Marks : 100**Instructions to the candidates:*

- 1) *All questions are compulsory.*
- 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) Define financial accounting. Explain scopes & objectives financial accounting. **[10]**
- b) Explain the "Accounting Conventions". **[10]**

OR

From the following trial balance and additional information of TAJ INDUSTRIES you are required to prepare the final accounts.

Trail balance as on 31.12.2010

Particulars	Dr Amt	Cr Amt
Capital		10,000
Sundry Debtors	15,400	
Drawings	1,800	
Machinery	7,000	
Sundry Creditors		12,800
Wages	10,000	
Purchases	38,000	
Opening stock	4,000	
Bank Balance	3,000	
Carriage Charges	300	
Salaries	400	
Rent & Taxes	900	
Sales		58,000
Total	80800	80800

**P.T.O.**

Additional Information

- a) Closing Stock Rs. 1200
- b) Outstanding Rent & Taxes Rs. 100
- c) Charge Depreciation on Machinery @ 10%
- d) Wages Prepaid Rs. 400 [20]

**Q2)** Explain the graphical presentation of 'Cost-Volume-Profit' Relationships (with diagrams), for mechanics of break even charts. [15]

OR

- a) Explain the limitations of Ratio analysis. [10]
- b) What are the factors causing Idle time? [5]

**Q3)** S Zone ltd. Sells goods on a gross profit of 25% Depreciation is considered in Cost of production. The following are the annual figures given :

Sr. No	Particulars	Rs
1	Sales (Two Month's Credit)	18,00,000
2	Material Consumed (One Month's Credit)	4,50,000
3	Wages Paid (One month lag in payment)	3,60,000
4	Administrative expenses (one month lag in payment)	1,20,000
5	Sales Promotion expenses (Paid quarterly in advance)	60,000
6	Income tax payable in 4 equal installments of which one falls in next year	1,50,000
7	Cash manufacturing expenses (One month lag in payment)	4,80,000

The Company keeps one month's stock each of raw materials and finished goods. It also keeps Rs. 40,000/- in cash. You are required to estimate the working capital requirements of the company on cash basis assuming 10% Safety margin. [15]

OR

Explain the concept & need of Working Capital Management. What are Factors affecting it? [15]

## SECTION - II

**Q4)** Explain the different techniques for evaluation of capital expenditure. Proposal. (Capital budgeting Techniques). **[15]**

OR

What is Capital Budgeting Process? Explain the limitations of it. **[15]**

- Q5)** a) ZARA Ltd. Has issued 5,000 12% Debentures of Rs. 100 each on 1.04.11. The issue price was fixed at Rs. 102/- floating charges being 5%. The Tax rate applicable to the company is 40%. The debentures are redeemable after 7 years at Rs.105/- each. What is the cost of debentures to the company? **[10]**
- b) Sachin Ltd. Issued Rs. 10,00,000/- 12% Preference Shares of Rs. 100/- each at 5% Premium. The floatation cost was 4%. The Preference shares will be redeemed at a premium of 10% after 9 years. The marginal rate of tax to the company as applicable is 40%. Compute the cost of preference shares to the company. **[10]**

OR

ABC Ltd. Issues Rs. 20,00,000/- 12% Debentures of Rs. 100/- each. The Debentures are redeemable after the expiry of 7 years. The company is in 35% tax bracket.

Required :

- a) Calculate the cost of debt after tax, if debenture are issued at
- i) Par
  - ii) 10% Discount
  - iii) 10% Premium
- b) If brokerage is paid at 2%, what will be the cost of debentures, if Issue is at par? **[20]**

**Q6)** Write a detailed note on Tally 9 package. Explain the terms. (Any 5) : **[15]**

- |                       |                        |
|-----------------------|------------------------|
| a) Purchase Voucher   | b) Sales Voucher       |
| c) Debit Note Voucher | d) Credit Note Voucher |
| e) Payment Voucher    | f) Contra Voucher      |

OR

What are the advantages of computers in accounting? **[15]**



P1155

[4066] - 102

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

DISCRETE MATHEMATICS

(Sem. - I) (2008 Course) (510902)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) Attempt any three questions from each section.
- 2) Answers to the two sections should be written in separate answer books.
- 3) Neat diagrams must be drawn wherever necessary.
- 4) You are advised to attempt not more than three questions from each section.
- 5) Your answers will be valued as a whole.
- 6) Assume suitable data, if necessary.

SECTION - I

- Q1)** a) Show that  $n^4 - 4n^2$  is divisible by 3 for all  $n > 2$  by mathematical induction. [4]
- b) Prove that  $A \cap (B - C) \subset A - (B \cap C)$ . [2]
- c) Out of the integer 1 to 100
- i) How many of them are not divisible by 3 nor 5 nor 7.
  - ii) How many are not divisible by 5 and 7 but divisible by 3. [6]
- OR
- Q2)** a) Using venn diagram prove or disprove the following : [6]
- i)  $A - (A \cap B) = A - B$
  - ii)  $A - B = A \cap \bar{B}$
  - iii)  $A \cap (B \cup C) \neq (A \cap B) \cap (A \cap C)$
- b) Among 100 students, 32 study maths, 20 study physics, 45 study biology. 15 study maths and biology, 7 study maths and physics, 10 study physics and biology, 30 do not study any of the three subjects. [6]
- i) Number of student studying exactly one of the three subjects.
  - ii) Number of student studying all three subjects.
- Q3)** a) Obtain DNF of  $P \vee (\sim P \rightarrow (q \rightarrow \sim r))$ . [4]
- b) Verify that proposition  $P \vee \sim(p \wedge q)$  is Tautology. [2]

P.T.O.

- c) Rewrite following statement using quantifier variables and predicate symbols.
- i) Some numbers are not rational
  - ii) There is student who like maths but not Geography. [2]
- d) Show that  $(p \wedge q) \wedge \sim (p \vee q)$  is contradiction. [4]

OR

- Q4)** a) Find the CNF and DNF for following without using truth table  $(p \rightarrow q) \wedge (q \rightarrow p)$ . [2]
- b) Determine whether the following is valid orgument [4]
- If Geeta goes to class, she is on time  
But Geeta is late  
She will therefore miss class
- c) Rewrite the following statements using quantifier variables and predicate symbols. [6]
- i) All birds can fly
  - ii) Not all bird can fly
  - iii) Some men are intelligent
  - iv) Some numbers are not rational
  - v) Each integer is either even or odd
  - vi) All prime numbers are not odd

- Q5)** a) A menu card in a restaurant display four soup, five main courses, three desserts and 5 beverages. How many different menu can a customer select if . [6]
- i) He select one item from each group without omission.
  - ii) He chooses to omit the beverages but select one each from other group.
  - iii) He chooses to omit the dessert but decides to take beverage and one item.
- b) A family of 4 brothers and 3 sisters is to be arranged in a row for photograph. In how many ways can they be seated it all sisters are together? [3]
- c) In how many ways can 6 men and 5 women sit in a line so that women occupy the even places? [2]

OR

- Q6)** a) Find the number of distinct permutation that can be formed from all letter of each word. **[4]**
- i) RADAR
- ii) UNUSUAL
- b) A box contains 6 white balls and 5 black balls find the number of ways 4 balls can be drawn from the box if. **[4]**
- i) Two must be white
- ii) All of them must have same colour
- c) If 3 dice are rolled, find the number of different outcomes. **[3]**

**SECTION - II**

- Q7)** a) Draw the Hasse diagram for the relation R on A.  $A = \{1, 2, 3, 4, 5\}$  whose relation matrix is given below. **[6]**

$$M_R = \begin{bmatrix} 1 & 1 & 1 & 1 & 1 \\ 0 & 1 & 1 & 1 & 1 \\ 0 & 0 & 1 & 1 & 1 \\ 0 & 0 & 0 & 1 & 1 \\ 0 & 0 & 0 & 0 & 1 \end{bmatrix}$$

- b) Define : **[6]**
- i) Surjective function.
- ii) Injective function.
- iii) Bijective function with suitable example.

OR

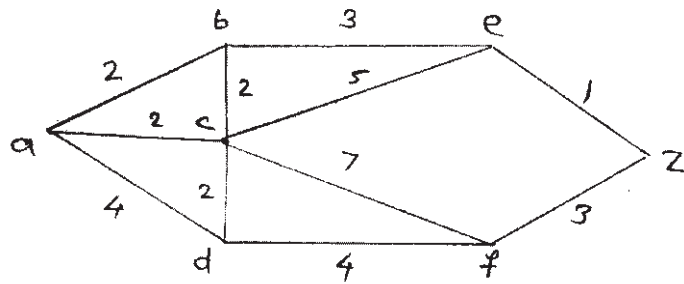
- Q8)** a) Let  $A = \{a, b, c, d\}$  and  $R = \{(a, b), (b, d), (a, c), (c, b)\}$  find transitive closure of R by warshall's algorithm **[6]**

$$M_R = \begin{bmatrix} 0 & 1 & 1 & 0 \\ 0 & 0 & 0 & 1 \\ 0 & 1 & 0 & 0 \\ 0 & 0 & 0 & 0 \end{bmatrix}$$

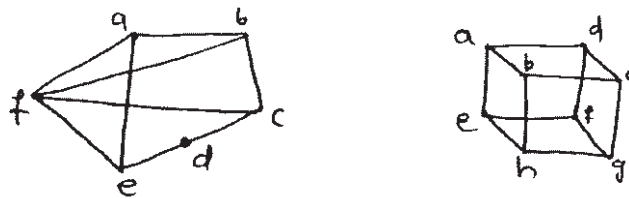
- b) Let  $A = \{1, 2, 3\}$  Determine whether relation R and S whose matrices  $M_R$  and  $M_S$  are given are equivalence relation or Not. [6]

$$M_R = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 1 \\ 0 & 1 & 1 \end{bmatrix} \quad M_S = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 1 \\ 1 & 0 & 0 \end{bmatrix}$$

- Q9) a) Find the shortest path using Dijkstra's algorithm [6]



- b) Identify whether graph given are planer or not [3]



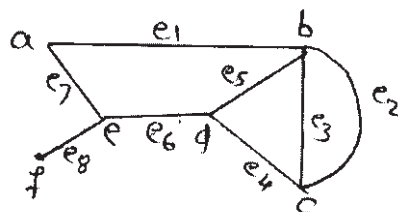
- c) Define edge connectivity and vertex connectivity with example. [3]

OR

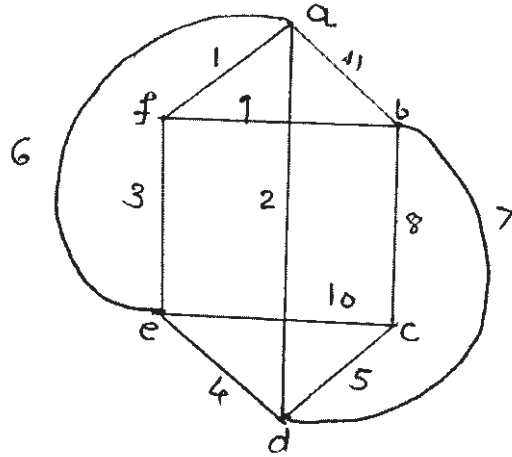
- Q10) a) Show that maximum number of edges in simple graph with n vertices is  $\frac{n(n-1)}{2}$ . [4]

- b) Give example of weighted graph which you observe in normal routine. [2]

- c) Find adjacency matrix incidence matrix for graph shown in figure. [6]



Q11) a) Find the minimum spanning tree using prim's algorithm for given graph. [6]

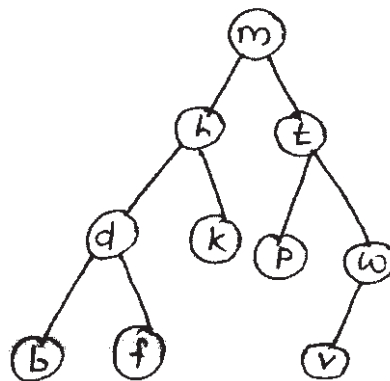


b) Explain fundamental circuits and fundamental cutset. [3]

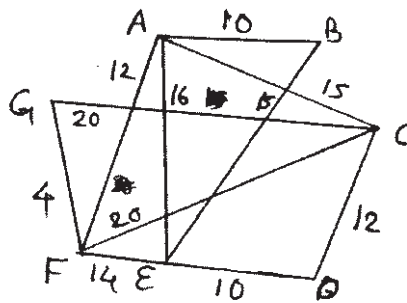
c) State whether the given set is prefix code justify [2]  
 $\{000, 001, 01, 10, 11\}$

OR

Q12) a) Find the preorder, postorder and inorder traversal of following tree. [5]



b) Give stepwise construction of minimum spanning tree for following graph using kruskal's algorithm. [6]





**P1156**

**[4066] - 105**

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

**MANAGEMENT SCIENCE**

**(Sem. - I) (2008 Course) (511905)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Answer any three questions from each section.*
- 2) *Answers three questions from Section I and three questions from Section II.*
- 3) *Answer to the two sections should be written in separate books.*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*
- 6) *Your answers will be valued as a whole.*
- 7) *Use of logarithmic tables, slide rule, Mollier charts, electronic pocket calculator and steam tables is allowed.*
- 8) *Assume suitable data, if necessary.*

**SECTION - I**

**Unit - I**

- Q1)** a) Differentiate clearly between management, Administration and Organization. [6]  
b) Enumerate different functions of management. Explain planning function in detail. [6]

OR

- Q2)** a) What are the different levels of management. [6]  
b) What are the different steps involved in setting up MBO. [6]

**Unit - II**

- Q3)** a) What is study of Economics for Human being? [6]  
b) What is wealth in Economics? How it is classified? [6]

OR

- Q4)** a) Explain the concept of utility in brief. [6]  
b) Explain what are the main areas of managerial economics? Explain in brief. [6]

**P.T.O.**

### **Unit - III**

- Q5)** a) Enumerate different forms of business organisation? Explain partnership with its advantages and disadvantages. [8]  
b) Draw the block diagram of matrix organisation. [3]

OR

- Q6)** a) Explain joint stock company in brief. [8]  
b) What are the types of partners. [3]

### **SECTION - II**

#### **Unit - IV**

- Q7)** a) Explain Manpower Planning in brief. [6]  
b) Explain communication in industry in brief. [6]

OR

- Q8)** a) Explain fredric Herzberg two factor Hygiene Theory of motivation. [6]  
b) Explain Job Evaluation in brief. [6]

#### **Unit - V**

- Q9)** a) Explain different reasons of Air Pollution & methods to control Air Pollution. [6]  
b) Explain different types of labour laws. [6]

OR

- Q10)** a) Explain important definitions, and scope of Factory Act 1948. [6]  
b) Explain Industrial safety in brief. [6]

#### **Unit - VI**

- Q11)** a) What do you understand by Quality circles concept used in industry. [5]  
b) What is copyright Act? Explain. [6]

OR

- Q12)** a) What are the main objectives of ISO9000 Quality system? [5]  
b) Explain the purpose of patent? Steps involved in getting patent. [6]



**P1157**

**[4066] - 302**

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

**DATABASES : CONCEPTS AND SYSTEMS**

**(Sem. - III) (2008 Course) (610902)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

- 1) *Section I : Q1 or Q2, Q3 or Q4, Q5 or Q6.*
- 2) *Section II : Q7 or Q8, Q9 or Q10, Q11 or Q12.*
- 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.*

**SECTION - I**

**Q1)** a) Explain advantages and disadvantages of Hierarchical Data Model and Network Data Model. **[5]**

b) Describe the Role of Query Processor and Database Administrator. **[6]**

OR

**Q2)** a) Explain in brief different levels of abstraction. Consider a two dimensional integer array of size  $n \times m$  that is to be used in your favorite programming language. Using array as an example, illustrate the difference between the three levels of abstraction. **[5]**

b) Describe System Catalog in detail. **[6]**

**Q3)** a) Notown Records has decided to store information about musicians who perform on its albums (as well as other company data) in a database. The company has wisely chosen to hire you as a database designer (at your usual consulting fee of \$2500/day).

Each musician that records at Notown has an SSN, a name, an address, and a phone number. Poorly paid musicians often share the same address, and no address has more than one phone. Each instrument used in songs recorded at Notown has a unique identification number, a name (e.g., guitar, synthesizer, flute) and a musical key (e.g., C, B-flat, E-flat). Each album recorded on the Notown label has a unique identification number, a title, a copyright date, a format (e.g., CD or MC), and an album identifier. Each song recorded at Notown has a title and an author. Each musician may play several instruments, and a given instrument may be played by several musicians.

**P.T.O.**

Each album has a number of songs on it, but no song may appear on more than one album. Each song is performed by one or more musicians, and a musician may perform a number of songs. Each album has exactly one musician who acts as its producer. A musician may produce several albums, of course.

Design a conceptual schema for Notown and draw an ER diagram for your schema. The preceding information describes the situation that the Notown database must model. Be sure to indicate all key and cardinality constraints and any assumptions you make. Identify any constraints you are unable to capture in the ER diagram and Briefly explain why you could not express them. [9]

- b) Describe significance of Disjoint and Overlapping design constraints. [3]

OR

- Q4)** a) Draw ER Diagram for Company enterprises which should be consist of Entity sets, attributes, relationships, mapping cardinality and keys, aggregation, specialization, Role, and Generalization. It will maintain information about all departments, Employees, Products, Raw Materials, Customers, Suppliers, All defects etc. [9]

- b) Explain strong entity set and weak entity set with suitable example. [3]

- Q5)** a) Briefly answer the following questions based on this schema: [8]

*Emp*(*eid*: integer, *ename*: string, *age*: integer, *salary*: real)

*Works*(*eid*: integer, *did*: integer, *pct time*: integer)

*Dept*(*did*: integer, *budget*: real, *managerid*: integer)

- i) Suppose you have a view SeniorEmp defined as follows:

```
CREATE VIEW SeniorEmp (sname, sage, salary)
```

```
AS SELECT E.ename, E.age, E.salary
```

```
FROM Emp E
```

```
WHERE E.age > 50
```

Explain what the system will do to process the following query :

```
SELECT S.sname
```

```
FROM SeniorEmp S
```

```
WHERE S.salary > 100,000
```

- ii) Give an example of a view on Emp that could be automatically updated by updating Emp.
- iii) Give an example of a view on Emp that would be impossible to update automatically) and explain why your example presents the update problem that it does.

- b) Explain different Relational Keys with suitable example. [4]

OR

- Q6) a) Explain intension and extension of Relation with suitable example. [6]  
b) Explain codd's comprehensive sub-language rules. [6]

**SECTION - II**

- Q7) a) The following relations keep track of airline flight information : [10]

Flights(*flno*: integer, *from*: string, *to*: string, *distance*: integer, *departs*: time, *arrives*: time, *price*: real)

Aircraft(*aid*: integer, *aname*: string, *cruisingrange*: integer)

Certified(*eid*: integer, *aid*: integer)

Employees(*eid*: integer, *ename*: string, *salary*: integer)

Note that the Employees relation describes pilots and other kinds of employees as well; every pilot is certified for some aircraft, and only pilots are certified to fly.

Write each of the following queries in SQL.

- i) Find the names of aircraft such that all pilots certified to operate them have salaries more than \$80,000.
  - ii) Identify the routes that can be piloted by every pilot who makes more than \$100,000.
  - iii) Print the *enames* of pilots who can operate planes with *cruisingrange* greater than 3000 miles but are not certified on any Boeing aircraft.
  - iv) A customer wants to travel from Madison to New York with no more than two changes of flight. List the choice of departure times from Madison if the customer wants to arrive in New York by 6 p.m.
- b) Explain advantages and disadvantages of PL/SQL. [2]

OR

- Q8) a) Explain REF cursor in PL/SQL with suitable example. [4]  
b) Write short notes on : [8]  
i) Stored Procedure and Stores Function  
ii) Embedded SQL

- Q9)** a) Let  $R$  be a relation schema with a set  $F$  of FDs. Prove that the decomposition of  $R$  into  $R_1$  and  $R_2$  is lossless-join if and only if  $F^+$  contains  $R_1 \cap R_2 \rightarrow R_1$  or  $R_1 \cap R_2 \rightarrow R_2$ . [7]
- b) Write a short note on Prototyping in database application. [4]

OR

- Q10)** a) Suppose you are given a relation  $R$  with four attributes  $ABCD$ . For each of the following sets of FDs, assuming those are the only dependencies that hold for  $R$ , do the following: (a) Identify the candidate key(s) for  $R$ . (b) Identify the best normal form that  $R$  satisfies (1NF, 2NF, 3NF, or BCNF). (c) If  $R$  is not in BCNF, decompose it into a set of BCNF relations that preserve the dependencies. [7]
- i)  $C \rightarrow D, C \rightarrow A, B \rightarrow C$   
 ii)  $B \rightarrow C, D \rightarrow A$   
 iii)  $ABC \rightarrow D, D \rightarrow A$   
 iv)  $A \rightarrow B, BC \rightarrow D, A \rightarrow C$   
 v)  $AB \rightarrow C, AB \rightarrow D, C \rightarrow A, D \rightarrow B$
- b) What is a minimal cover for a set of FDs? Describe an algorithm for computing the minimal cover of a set of FDs, and illustrate it with an example. [4]

- Q11)** a) Consider a database with objects  $X$  and  $Y$  and assume that there are two transactions  $T_1$  and  $T_2$ . Transaction  $T_1$  reads objects  $X$  and  $Y$  and then writes object  $X$ . Transaction  $T_2$  reads objects  $X$  and  $Y$  and then writes objects  $X$  and  $Y$ . [8]
- i) Give an example schedule with actions of transactions  $T_1$  and  $T_2$  on objects  $X$  and  $Y$  that results in a write-read conflict.  
 ii) Give an example schedule with actions of transactions  $T_1$  and  $T_2$  on objects  $X$  and  $Y$  that results in a read-write conflict.  
 iii) Give an example schedule with actions of transactions  $T_1$  and  $T_2$  on objects  $X$  and  $Y$  that results in a write-write conflict.  
 iv) For each of the three schedules, show that Strict 2PL disallows the schedule.
- b) Describe Timestamp protocol for concurrency control. [4]

OR

- Q12)** Write a short note on : [12]
- a) Fuzzy CheckPoint  
 b) Deadlocks Prevention



**P1158**

**[4066] - 304**

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

**COMPUTER COMMUNICATIONS & NETWORKS**

**(2008 Pattern) (610904) (Sem. - III)**

*Time : 3 Hours]*

*[Max. Marks : 70*

*Instructions to the candidates:*

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

**SECTION - I**

**Q1)** a) Write Difference between Synchronous & Asynchronous transmission with example. **[6]**

b) What are different types of Satellite? Explain with example. **[6]**

OR

**Q2)** a) Explain Fiber Optic media. **[6]**

b) Write difference between FDM, TDM, WDM. **[6]**

**Q3)** a) Calculate CRC if the data to be sent is 100100.  
The generator polynomial is  $G(x)=x^3+x^2+1$ . **[6]**

b) Explain network topologies with suitable example. **[6]**

OR

**Q4)** a) Discuss HDLC protocol specification with reference to the following: **[6]**

i) Type of Stations.

ii) Configuration.

iii) Type of frames.

b) Explain OSI Protocol Stack. **[6]**

**Q5)** a) Explain Bluetooth architecture with neat diagram. **[6]**

b) Explain CSMA with CSMA/ CD technique. **[5]**

OR

**P.T.O.**

- Q6)** a) Explain working of WDMA technique. [6]  
b) Discuss VLAN with neat diagram, state their advantage over regular LAN. [5]

**SECTION - II**

- Q7)** a) Discuss the parameter of quality of service in network layer. [6]  
b) Explain Leaky bucket algorithm. [5]

OR

- Q8)** a) Explain IP protocol with neat diagram. [6]  
b) What is meant by congestion? How to prevent it? [5]

- Q9)** a) Explain difference between TCP & UDP. [6]  
b) How is connection established in TCP? Explain two army problem. [6]

OR

- Q10)** a) Explain timer management in TCP. [6]  
b) What is silly window syndrome? How to overcome it. [6]

- Q11)** a) Explain Email Architecture with protocols. [6]  
b) Write short note on :  
i) IMAP ii) HTTP [6]

OR

- Q12)** a) What is difference between FTP & TFTP. [6]  
b) Explain DNS with different types of Domain. [6]





P799

[4066] - 101

M.C.A. (Faculty of Engineering)

PROBLEM SOLVING AND PROGRAMMING IN C

(2008 Pattern) (Sem. - 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) Define Algorithm. Mention its characteristics and write in brief about O-notation during analysis of algorithm. [6]
- b) Devise an algorithm to convert given binary number to its decimal integer. [6]

**OR**

- Q2) a) What do you mean by Flowchart? Explain in brief about various notations with suitable example. [6]
- b) Devise an algorithm to find out square root of given integer number. [6]
- Q3) a) What do you mean by Operator Precedence and Associativity? Explain it with suitable example. [6]
- b) Write a syntax for *for*, *while* and *do..while* loop. Distinguish between *while* and *do..while* loop. [6]

What will be output if you will execute following c code?

```
#include<stdio.h>
int main() {
    int i;
    for(i=0;i<5;i++){
        int i=10;
        printf(“%d”,i);
        i++; }
    return 0; }
```

P.T.O

**OR**

- Q4)** a) Define iteration and recursion. Mention the difference between them with an example. [6]  
b) Write a program to read in 10 numbers and compute the average, maximum and minimum values. [6]

- Q5)** a) What will be output of the following C code with justification: [6]  
i) 

```
#include<stdio.h>
void main () {
    char arr[11] = "The African Queen";
    printf("%s",arr); }
```

  
ii) 

```
#include<stdio.h>
void main () {
    int xxx[10] = {5};
    printf("%d%d", xxx[1], xxx[9]); }
```

  
b) Write a C program to Find last occurrence of character c in string without using string library function. [5]

**OR**

- Q6)** a) Explain *any three* string library functions used in C with basic syntax and suitable example. [6]  
b) Write a C program to multiply two matrices. [5]

**SECTION - II**

- Q7)** a) Write a short note on the following with suitable example: [6]  
i) Pointer and Array.  
ii) Constant Pointer.  
b) What will be output if you will execute following c code? [6]  
i) 

```
#include<stdio.h>
void main () {
    int array [2][3] = {5,10,15,20,25,30};
    int (*ptr)[2][3]=&array;
    printf("%d\t", ***ptr);
    printf("%d\t", ***(ptr+1));
    printf("%d\t", **(*ptr+1));
    printf("%d\t", *(*ptr+1)+2);
}
```

```

ii) #include<stdio.h>
    #define var 3
    void main (){
        short num[3][2] = {3,6,9,12,15,18};
        printf(“%d %d”, *(num+1)[1], **(num+2));
    }

```

**OR**

- Q8)** a) Write a basic syntax about malloc () and realloc () in C. Also write a snippet in C to allocate a memory dynamically for 2D integer array. [6]  
 b) Write a C program to read through an array of any type using pointers and scan through this array to find a particular value. [6]

- Q9)** a) Distinguish between the following: [6]  
 i) Array and structure.  
 ii) Structure and Union.  
 b) Write a C program to find maximum value from given two integers using macro with parameters. [6]

**OR**

- Q10)**a) Explain self-referential structures and its application. [6]  
 b) Write a simple database program that will store a persons detail such as age, date of birth, address and display it in well format. [6]

- Q11)**a) Write a difference between Text file and Binary file. [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 the followings: [4]  
 i) Error handling.  
 ii) Redirection.  
 b) Write a program to compare two files and print out the lines where they differ. [7]





P800

[4066] - 104

F.Y.M.C.A. (Under Faculty of Engg.)

PROBABILITY AND STATISTICS

(2008 Pattern) (510904) (Sem. - I)

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 statistical table and electronic pocket calculator is allowed.
- 4) All questions are compulsory.

**SECTION - I**

- Q1) a) The probability that India wins a cricket test match against Austrelia is  $\frac{2}{5}$ . If India and Austrelia play 3 test matches, what is the probability that
- i) India will lose all the three matches.
  - ii) India will win at least one test match.
  - iii) India will win all the three test matches. [6]
- b) First factory  $F_1$  produces 1000 articles, 20 of them being defective, second factory  $F_2$  produces 4000 articles, 40 of them being defective and third factory  $F_3$  produces 5000 articles, 50 of them being defective. All these articles are put in one stock pile. One of them is chosen and is found to be defective. What is the probability that it is from the factory  $F_1$ . [6]

**OR**

- a) State and prove Baye's theorem. [6]
- b) A committee of 4 is to be formed from 3 engineers, 4 economists, 2 statisticians and 1 C.A.
  - i) What is the probability that each of the four categories of profession is included in the committee.
  - ii) What is the probability that the committee consists of the C.A. and at least one engineer. [6]

P.T.O

- Q2)** a) 10% of the bolts produced by a certain machine turn out to be defective. Find the probability that in a sample of 10 bolts selected at random exactly two will be defective using.
- Binomial distribution.
  - Poisson distribution and comment on the result. [6]
- b) The probability of successful rocket launch is 0.7. Find the probability that
- The successful launch takes place on the 4<sup>th</sup> attempt.
  - Less than 3 attempts will be required to make a successful launch.[6]

**OR**

- a) Explain the following probability distributions with suitable example.
- Multinomial distribution.
  - Negative Binomial distribution. [6]
- b) A bag contains 20 balls of which 15 are of red colour & 5 of black colour. A random sample with without replacement of 5 balls is taken. Find the probability that the sample contains 2 black balls. [6]

- Q3)** a) Write a short note on Normal distribution. [5]
- b) Three balls are drawn random from a box containing 2 white, 3 red and 4 black balls. If  $x$  denotes the number of white balls drawn and  $y$  denotes the number of red balls drawn, find the joint probability distribution of  $x, y$ . [6]

**OR**

- a) If  $x$  follows exponential distribution with mean 120 find  $C$  such that
- $$P(X > C) = \frac{1}{3}. \quad [5]$$
- b) Define the following:
- Joint Density Function.
  - Marginal distribution.
  - Conditional probability distribution. [6]

**SECTION - II**

- Q4)** a) What is point estimate? What properties of estimator will 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.  
Find:
- the mean of the population.
  - the standard deviation of the population.
  - the mean of the sampling distribution of means. [6]

**OR**

- a) Explain the following terms:
- Population.
  - Random sampling.
  - Sample Statistics. [6]
- b) A coin is tossed 200 times.  $p$  and  $q$  are the probabilities of getting head and tail respectively. Using central Limit Theorem find the probability that head will appear more than 140 times and less than 150 times? [6]

- Q5)** a) Explain the following terms. [6]
- Null hypothesis.
  - Level of significance.
  - Type I and Type II errors.
- b) In a sample of 500 parts manufactured by a company, the number of defective parts were found to be 42. The company however claimed that 6% of their product is defective. Is the claim valid? Use 5% l.o.s. (Table value = 1.96) [6]

**OR**

- a) Write a short note on student -t distribution. [6]
- b) To test the belief that high income families send their children to English Medium School and low income families send their children to Marathi medium school, 500 families were selected at random and the following results were obtained. Check for 5% l.o.s. and the table value is  $\chi^2_{\text{table}} = 3.841$ . [6]

Income \ Medium	English	Marathi
High	203	80
Low	115	102

**Q6)** a) Define Statistical Quality Control (SQC). Write the advantages and limitations of SQC. [6]

b) Ten samples each of size 5 are drawn at regular intervals from a manufacturing process. Their range is given below. Calculate the control limits with respect to R chart. Comment on the state of control. [5]

Sample No.	1	2	3	4	5	6	7	8	9	10
Range	7	5	7	9	5	8	8	6	7	6

(Given  $D_3 = 0$ ,  $D_4 = 2.15$ )

**OR**

a) Write a short note on mean chart. [6]

b) Describe the  $\chi^2$  test as a test of goodness of fit. Write the steps. [5]





P801

[4066] - 201

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

**OBJECT ORIENTED PROGRAMMING**

(2008 Pattern) (510909) (Sem. - II)

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

- 1) *Answer 3 questions from Section I and 3 questions from Section II.*
- 2) *Answers to the two sections should be written in separate books.*

**SECTION - I**

- Q1)** a) Compare procedural and object oriented programming techniques. [5]  
b) Explain the following with suitable example: [6]  
i) Abstraction.  
ii) Polymorphism.  
iii) Inheritance.

**OR**

- Q2)** a) What is the need for object oriented programming? [4]  
b) Explain any four features of object oriented Programming with an example. [7]
- Q3)** a) Answer in short. [6]  
i) Differentiate between a class and a struct.  
ii) What is the difference between **new** and **delete** operators?  
iii) When does an inline function cease to be inline?  
b) What is a function prototype? Explain with example. [6]

**OR**

- Q4)** a) What is function overloading? Write a program in C++ to overload a function Area () that Calculates area of Circle, Rectangle and Square.[6]  
b) Answer in short. [6]  
i) What are constant arguments?  
ii) Can inline functions be nested?  
iii) Compare *cout* and *cin* over *printf ()* and *scanf()*?

**P.T.O.**

- Q5)** a) Explain access specifiers with an example. [5]  
b) Write a program to dynamically allocate and de-allocate memory for an integer array of maximum 10 elements. [7]

**OR**

- Q6)** a) Write a program to dynamically allocate and deallocate memory for a r X c matrix. [7]  
b) Explain static data members and static member functions. [5]

**SECTION - II**

- Q7)** a) What are the rules for operator overloading? Explain the need for operator overloading. [5]  
b) Write a program to overload the assignment operator. [6]

**OR**

- Q8)** a) Explain binary and unary operators in detail. [5]  
b) Write a program to overload the '+' operator. [6]

- Q9)** a) What is the problem of ambiguity? Explain with an example. [6]  
b) Explain virtual functions with an example. [6]

**OR**

- Q10)**a) Explain the types of inheritance. [5]  
b) Write a program to explain pure virtual functions. [7]

- Q11)**a) Write a note on I/O manipulators. [5]  
b) Write a program to maintain employee details (empno, empname, salary) in a file along with error handling. [7]

**OR**

- Q12)** Write short notes on any three [12]  
a) try.....catch block.  
b) Sequential file processing.  
c) C++ Streams.  
d) File Operations.



**[4066] - 203**  
**P802**  
**F.Y.M.C.A. (Engineering Faculty)**  
**OPERATIONS RESEARCH**  
**(2008 Pattern) (510911) (Sem. - II)**

Time : 3 Hours]

[Max. Marks :70

*Instructions to the candidates:*

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

**SECTION - I**

- Q1)** a) A factory manufactures two products 'X' and 'Y' on which the profits earned per unit are Rs. 5 and Rs. 6, respectively. Each product is processed on two machines  $M_1$  and  $M_2$ . Product 'X'. requires one minute of processing time on  $M_1$  and two minutes on  $M_2$  while 'Y' requires one minute on  $M_1$  and one minute on  $M_2$ . Machine  $M_1$  is available for not more than 7 Hrs and 40 minutes while machine  $M_2$  is available for not more than 10 Hrs during any working day. Find the number of units of products X and Y to be manufactured to get maximum profit. [8]
- b) Write a short note on 'Sensitivity Analysis'. [4]

OR

- a) Solve the following LPP by big M method in simplex
- Minimize  $z = 2x + 3y$
- $x + y \geq 5$
- $x + 2y \geq 6$
- $x, y \geq 0$  [10]
- b) Define feasible solution and optimal solution in L.P. Model. [2]

- Q2)** a) Compare the starting solutions obtained by [7]
- i) Northwest corner.
  - ii) Least - cost.
  - iii) Vogel Approximation method for the following model.

**P.T.O**

	D <sub>1</sub>	D <sub>2</sub>	D <sub>3</sub>	Supply
S <sub>1</sub>	0	2	1	6
S <sub>2</sub>	2	1	5	7
S <sub>3</sub>	2	4	3	7
Demand	5	5	10	

- b) Write a short note on the modified distribution method [MODI]. [5]

OR

- a) The head of the department has five Jobs A, B, C, D, E & five subordinates V, W, X, Y, Z. The number of hours each man would take to perform each job is as follows:

	V	W	X	Y	Z
A	3	5	10	15	8
B	4	7	15	18	8
C	8	12	20	20	12
D	5	5	8	10	6
E	10	10	15	25	10

- Find the optimum allocation of jobs to the subordinates. [6]
- b) Explain the following in context of Assignment problem: [6]
- Balanced Assignment problem.
  - Hungarian method.

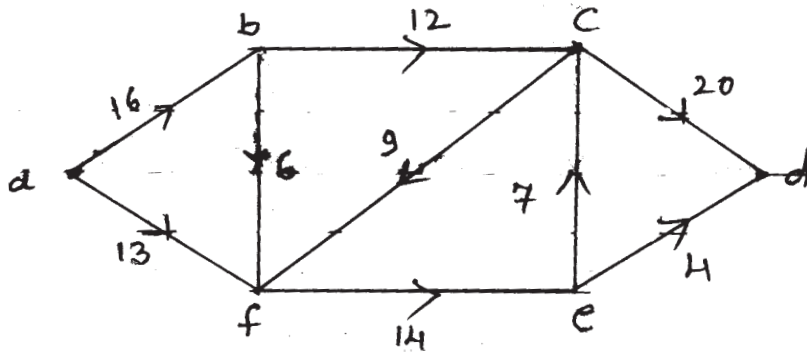
- Q3) a) From the information given below, draw network diagram and critical path. Find the probability that the project will be completed within 55 days. [7]

Activity	t <sub>o</sub>	t <sub>m</sub>	t <sub>p</sub>
1 - 2	4	6	8
2 - 3	5	7	15
2 - 4	4	8	12
3 - 6	15	20	25
3 - 5	10	18	26
4 - 6	8	9	16
5 - 7	4	8	12
6 - 7	1	2	3
7 - 8	6	7	8

- b) Compare PERT and CPM. [4]

OR

- a) Find the maximal flow for the following network. [7]



- b) Explain the steps of kruskal's algorithm. [4]

**SECTION - II**

Q4) a) PC - soft is a growth oriented company which establishes monthly performance goals for its sales force. PC - soft determines that the sales force has a maximum available hours per month for visits of 640 hours. Further, it is estimated that each visit to a potential new client requires 3 hours and each visit to a current client requires 2 hours. PC - soft company establishes. Two goals for the coming month:

- i) Contact at least 200 current clients.
- ii) Contact at least 120 new clients over - reaching either goal will not be penalized

Solve. The G.P. [7]

- b) What are the various forecasting techniques? Explain them in brief. [5]

OR

- a) Discuss the advantages and disadvantages of solving Linear Integer programming problems by
- i) Cutting plane method,
  - ii) branch and bound method. [6]

- b) Fit a straight line trend for the following time series using least square method.

Year	1994	1995	1996	1997	1998	1999	2000
No. of Prod <sup>n</sup> units.	125	128	133	135	140	141	143

Estimate the no. of production units for the year 2001 [6]

**Q5) a)** The following pay off table for a particular venture has been prepared:[8]

Decision Alternatives	States of Nature				
	N <sub>1</sub>	N <sub>2</sub>	N <sub>3</sub>	N <sub>4</sub>	N <sub>5</sub>
D <sub>1</sub>	150	225	180	210	250
D <sub>2</sub>	180	140	200	160	225
D <sub>3</sub>	220	185	195	190	180
D <sub>4</sub>	190	210	230	200	160

Determine the optical decision using:

- i) Minimax criterion
  - ii) Regret criterion
  - iii) Laplace criterion
  - iv) Hurwicz criterion.
- b) Write the steps of decision making process. [4]

OR

- a) The probability of demand for lorries for hiring on any day in a given districts is as follows. [7]

No.of Lorries Demanded	0	1	2	3	4
Probability	0.1	0.2	0.3	0.2	0.2

Lorries have a fixed cost of Rs. 90 each day to keep the daily hire charges (net of variable costs of running) Rs. 200. If the lorry hire - company owns 4 lorries, what is its daily expectation? If the company is about to go into business and currently has no lorries, how many lorries should it buy?

- b) What are the types of Decision making environment? What are the steps of decision making process? [5]

**Q6) a)** A dentist schedule all its patients for 30 minutes appointment. Some of the patients take more or less time than 30 min. depending on the dental work to be done. The following summary shows the various categories of work, their probability and time actually needed to complete the work.

Category of Service	Time Required (min.)	Probability of category
Filling	45	0.40
Crown	60	0.15
Cleaning	15	0.15
Extraction	45	0.10
Checkup	15	0.20

Simulate the dentist clinic for 4 hrs & determine the averaging waiting time for the patients as well as idle time of doctor. Assume that all the patients show-up at the clinic at exactly their scheduled arrival time starting at 8 am. Use following random numbers for handling above problem:

40, 82, 11, 34, 25, 66, 17, 79. [7]

- b) Discuss various steps of simulation process. [4]

OR

- a) A milk dairy records sales of 1 liter packets during 100 days are as follows:

Demand	8	9	10	11	12	13	14	15	16	17
N.of. Days	5	9	10	15	13	8	11	14	8	7

Using the following random no. simulate the demand for the first 15 days:

[23, 64, 18, 96, 71, 46, 54, 8, 11, 81, 75, 39, 28, 43, 52] [7]

- b) Explain the three common most methods of collecting observations in simulation. [4]







**P803**

**[4066] - 404**

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

**JAVA PROGRAMMING**

**(2008 Course) (610912) (Sem. - IV)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

- 1) *Answer any 3 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.*

**SECTION - I**

- Q1)** a) What feature of Java makes it platform independent language. [5]  
b) What is the need of a Exception handling? With example explain how exception can be caught in a program. [5]  
c) Explain use of a super keyword in inheritance. [2]

**OR**

- Q2)** a) Explain what is vector. List and explain any five methods of vector class. [6]  
b) Explain with example two ways to create a thread in Java. [6]
- Q3)** a) Write a program to display a “Welcome” message in the window when left mouse button is clicked. [6]  
b) What are different listener interfaces in Java? Explain any two. [6]

**OR**

- Q4)** a) What are different Layout managers? Explain Border Layout in detail.[6]  
b) Write a program to calculate total salary of a employee by adding 45% D.A. to his basic salary. User should input employee id, name of employee and basic salary. On “Calculate Salary” Button click it should calculate and display total salary. (Design User Interface using required components.) [6]
- Q5)** a) How to pass parameters to an applet? Explain with example. [6]  
b) Differentiate between applet and application. [5]

***P.T.O***

**OR**

- Q6)** a) List and explain various methods of Applet class. [6]  
b) How to execute an applet? Explain with example. [5]

**SECTION - II**

- Q7)** a) Write a program to accept five numbers from the user. Display the addition of these numbers. [6]  
b) What is object serialization? Explain any five methods of ObjectOutputStream class. [6]

**OR**

- Q8)** a) Write a program to accept a number from user. Display whether the inputted number is even or odd. [6]  
b) List and explain any five methods of BufferedReader class. [6]

- Q9)** a) Write a Java code to connect to a database using JDBC. [6]  
b) Explain Statement class in detail. [5]

**OR**

- Q10)** a) Explain different JDBC drivers. [6]  
b) Write a Java code to insert student id, name of student and marks of three subjects into the database. (do not write database connectivity code). [5]

- Q11)** a) Explain ServerSocket and Socket classes. [6]  
b) Enlist various networking classes in java. Explain in brief. [6]

**OR**

- Q12)** a) Explain URL and URLConnection class. [6]  
b) What is the use of InetAddress class. Explain any four methods of this class. [6]



Total No. of Questions : 6]

[Total No. of Pages : 2

**P804 [4066] - 501**

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

**PRINCIPLES AND PRACTICES FOR IT PROJECT MANAGEMENT**

**(New 2008 Pattern) (Sem. - V) (710901)**

*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 indicate full marks.*
- 4) *Assume suitable data, if necessary.*

**SECTION - I**

**Q1)** a) Discuss the importance of management & elaborate the functions of management. **[6]**

b) Write a note on business ethics & social responsibility. **[5]**

OR

a) What is project management? Describe project management life cycle. **[6]**

b) Explain the phases in the process of management. **[5]**

**Q2)** How information technology can be applied in marketing management? Justify your answer by giving suitable examples. **[12]**

OR

Write a short note on: **[12]**

a) Explain product life cycle management.

b) Discuss quality control & quality assurance.

**Q3)** What is 8/80 Rule? What is zero based budgeting? Explain the process and types of budgeting a project. **[12]**

OR

Write a note on Risk identification, Classification, Mitigation and Management. **[12]**

**P.T.O**

## SECTION - II

**Q4)** Write a note on managing team issues. Explain the process of revision of a project plan. Also explain why there is a need for project plan revision. [11]

OR

Explain the process of revision of a project plan. Also explain why there is a need for project plan revision. [11]

**Q5)** Explain the strategies for conflict management, stress management and energy management. [12]

OR

Explain how the interview process is carried out while deciding appropriate candidate while forming a team structure. [12]

**Q6)** a) Explain the IT approaches towards supply chain management. [7]

b) Write a note on Six Sigma. [5]

OR

What is an impact of IT quality management systems on the IT organizations? Explain with suitable illustrations. [12]



Total No. of Questions : 12]

[Total No. of Pages : 2

**P805 [4066] - 503**

**T.Y.M.C.A. (Under Faculty of Engineering)**

**ADVANCED DATABASES**

**(2008 Course) (710903) (New) (Sem. - V)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

- 1) *Answer 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)** Explain File Scan and Index Scan Methods used to perform Selection Operation on a relation. **[11]**

**OR**

**Q2)** Explain Hash join Algorithm used to implement natural join and equi-joins. **[11]**

**Q3)** Explain in detail Centralized and Client Server System. **[12]**

**OR**

**Q4)** Explain the different architectural models used for Parallel Machines. **[12]**

**Q5)** a) Compare Object - Oriented and Object - Relational Databases. **[6]**

b) With an example explain the concepts of Nesting and Unnesting. **[6]**

**OR**

**Q6)** Explain the different approaches used to make an object persistent while turning a language into Data Base Programming Language. **[12]**

**SECTION - II**

**Q7)** a) Discuss the different data smoothing Techniques. **[8]**

b) Explain architecture of data warehouse. **[4]**

**OR**

**Q8)** a) Explain in detail the dimensional data modeling. **[8]**

b) Compare : OLTP and OLAP. **[4]**

**P.T.O**

- Q9)** a) Write short note: Apriori Algorithm. [7]  
b) How we can make K-means algorithm for clustering scalable? [3]  
c) What is decision support system? [2]

**OR**

- Q10)** a) Explain supervised and unsupervised clustering. [5]  
b) What is Bayesian classifier? [4]  
c) What is meant by outlier analysis? [3]

- Q11)** a) What are the drawbacks of page rank algorithm? [3]  
b) Explain the following terms: [8]  
i) Inverted index.  
ii) Hyperlinks.  
iii) Homonyms.  
iv) Ontologies.

**OR**

- Q12)** a) Write short note : Popularity ranking. [7]  
b) Explain the following terms. [4]  
i) Signature files.  
ii) Information Extraction.



P806

[4066] - 504

**T.Y.M.C.A. (Engineering Faculty)**  
**ENTERPRISE RESOURCE PLANNING**  
**(2008 Pattern) (Sem. - V) (710904) (New)**

*Time : 3 Hours]*

*[Max. Marks :70*

*Instructions to the candidates:*

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

**SECTION - I**

- Q1)** a) Why many ERP implementations do fail and what are the remedies? Explain with suitable example. [6]  
b) Explain ERP system architecture with suitable diagram. [6]

**OR**

**Q2)** Indian Railways has got Computerized Railway Reservation System. It has provided an Internet based service through its website [www.irctc.co.in/](http://www.irctc.co.in/) to book tickets online. How does this system of Indian Railways compares with ERP system? [12]

- Q3)** a) What is the usefulness of ERP in competitive strategy formulation? Explain with suitable example. [6]  
b) Explain the scope of an ERP system with suitable example. [6]

**OR**

- Q4)** a) What are the organizational requirements for ERP implementation? What is the impact of Organization Culture on it? [6]  
b) Explain the business value of an ERP system with suitable example. [6]

**Q5)** Which are the Critical Success Factors for ERP implementation? What are the reasons for ERP failures and their remedies? [11]

**OR**

- Q6)** a) Explain the ERP implementation strategies with suitable example. [6]  
b) Explain ERP System Architecture & infrastructure requirements. [5]

*P.T.O*

**SECTION - II**

- Q7)* a) Explain the selection criteria for ERP packages. [6]  
b) Explain the ERP design and customization issues. [6]

**OR**

*Q8)* Write your comment on “In-house development of ERP package v/s procurement of off the shelf ERP package with its customisation”. [12]

- Q9)* a) Explain the integration of E-Business with ERP. [6]  
b) Explain ERP integration with CRM with suitable example. [6]

**OR**

- Q10)* a) Explain ERP systems in global context with an example. [6]  
b) Explain the Service Oriented Architecture in the context of ERP implementation. [6]

*Q11)* Explain the Finance and Manufacturing modules of ERP. [11]

**OR**

*Q12)* Explain relationship between the Materials Management, Manufacturing, Quality Control and Despatch & Invoicing modules. [11]





P807

[4066] - 11

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

PROBLEM SOLVING AND PROGRAMMING IN C

(115001) (2005 Pattern) (Sem. - I)

Time : 3 Hours]

[Max. Marks :100

*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) How to analyze algorithm? And explain various notations used to analyzed it. [6]  
 b) Give algorithmic development for exchanging two variables without using third variable. [4]  
 c) Given a number  $m$ , devise Pseudo-algorithm to compute its square root. [8]

**OR**

- Q2)** a) Define Algorithm. And explain the tools to devise any algorithm. [6]  
 b) Brief about algorithmic development for generating a prime number up to given  $n$  numbers. [4]  
 c) Implement the Fibonacci algorithm function that accepts as input two consecutive Fibonacci numbers and returns as output the next Fibonacci number. [8]

- Q3)** a) Define function and brief about its type. Also explain various prototype of functions in 'C'. [8]  
 b) What is the output of the following program code? Justify your answer. [8]

```

i) main()
   {
       char s[] = "man";
       int i;
       for(i=0;s[i];i++)
           printf("\n%c%c%c%c",s[i],*(s+i),*(i+s),i[s]);
   }

```

**P.T.O**

```

ii) #include<stdio.h>
void fun(int*, int*);
int main ()
{
    int i=5, j=2;
    fun(&i, &j);
    printf(“%d, %d”,i,j);
    return 0;
}
void fun(int *i, int *j)
{
    *i = *i**i;
    *j = *j**j;
}

```

**OR**

- Q4)** a) Explain various parameter passing techniques in ‘C’. [8]  
 b) Write a C program which reads a string and check whether string is palindrome or not. [8]

- Q5)** a) What will be the output of the following program? Justify your answer.[8]

```

i) #include<stdio.h>
int main () {
    int i=3;
    int *j;
    int **k;
    j=&i;
    k=&j;
    printf(“%u%u%d”,k,*k,**k);
    return 0;
}
ii) #include<stdio.h>
int main(){
    char arr[10];
    arr = “world”;
    printf(“%s”,arr);
    return 0;
}

```

- b) Write a C program using pointers to accept two matrices from the user and perform multiplication of given matrices. [8]

**OR**

- Q6)** a) i) Differentiate between calloc(), realloc () and malloc () functions in C.[8]  
ii) Point out the error from following code and correct it.

```
A. int main()
    {
        int arr[3][3] = { 1, 2, 3, 4};
        Printf ("%d\n", *((*(arr))));
        return 0;
    }
```

```
B. #include<stdio.h>
int main()
{
    char s[] = "IndiaBIX";
    char t[25];
    char *ps, *pt;
    ps = s;
    pt = t;
    while(*ps)
        *pt++=*ps++;
    /* Add a statement here */
    printf("%s\n",t);
    return 0;
}
```

- b) Write a C program using pointers to read an array of integers and sort it. [8]

### SECTION - II

- Q7)** a) Explain command line arguments in 'C'. [4]  
b) Explain with suitable examples self referencing structure. [6]  
c) Define a structure called Hospital that will describe following information:[8]  
i) Patient ID  
ii) Patient name  
iii) Ward type  
iv) Referenced by  
v) Patients History  
vi) No of days  
vii) Amount applicable

Using structure as Hospital create array of patients and write a C program to read the information about all patient's info. While displaying final information calculate the bill paid by the patient.

**OR**

- Q8)** a) Define macro and explain its application in 'C' program with and without parameter using suitable example. [4]  
b) Explain various storage classes in 'C'. [8]  
c) What will be the output of the program & justify your answer. [6]

i) 

```
#include<stdio.h>
int main()
{
    union a
    {
        int i;
        char ch[2];
    };
    union a u;
    u.ch[0]=3;
    u.ch[1]=2;
    printf("%d, %d, %d\n", u.ch[0], u.ch[1], u.i);
    return 0;
}
```

ii) 

```
#include<stdio.h>
int main ()
{
    struct node
    {
        int data;
        struct node * link;
    };
    struct node *p, *q;
    p = (struct node *) malloc(sizeof(struct node));
    q = (struct node *) malloc(sizeof(struct node));
    printf("%d, %d\n", sizeof(p), sizeof(q));
    return 0;
}
```

- Q9)** a) Write a C program to count number of alphabets and numbers in given text file. [8]  
b) Explain the following file handling functions in C with suitable example:[8]  
i) getw ()                      ii) ferror()  
iii) fprintf ()                iv) ftell()

**OR**

- Q10)**a) Explain redirection and file types in 'C' file handling with suitable example. [8]  
b) Write a C program to copy the contents of one text file to another text file. [8]
- Q11)**a) Approximate using Simpson's Rule with  $n = 4$ . [8]  
b) Explain Direct and iterative method. [8]

**OR**

- Q12)**a) Explain the following: [8]  
i) Forward and backward substitution.  
ii) Partial pivoting in Gauss Elimination method.  
b) Determine the real roots of  $f(x) = e^{-x} - x$  using three iterations of secant method. [8]



P808

[4066] - 14

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

PROBABILITY AND STATISTICS

(Sem. - I) (2005 Pattern) (115004)

Time : 3 Hours]

[Max. Marks :100

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 statistical table and electronic pocket calculator is allowed.
- 4) All questions are compulsory.

**SECTION - I**

- Q1)** a) A bag contains 6 green, 5 yellow and 7 white balls. 4 balls are drawn at random from the box. Find the probability that among the balls drawn, there is at least one ball of each colour. [6]
- b) Explain the terms with example.
- i) Independent events.
  - ii) Sample space.
  - iii) Probability of an event. [6]
- c) The letters of the word STATISTICS are arranged at random. Find probability that vowels occupy even places. [5]

**OR**

- a) The chance that doctor A will diagnose a disease X correctly is 60%. The chance that a patient will die by his treatment after correct diagnosis is 40% and the chance of death by wrong diagnosis is 70%. A patient of doctor A, who had disease X, died.  
Find the probability that his disease was diagnosed correctly? [6]
- b) State and prove Baye's theorem. [6]
- c) A shelf has 6 mathematics books and 4 physics books. Find the probability that three particular mathematics books will be together. [5]

P.T.O

- Q2)** a) Explain the following probability distributions with suitable example.
- Binomial distribution.
  - Negative binomial distribution.
  - Uniform distribution. [6]
- b) The probability of successful rocket launch is 0.7. Find the probability that
- the successful launch takes place on the 4<sup>th</sup> attempt.
  - less than 3 attempts will be required to make a successful launch. [6]
- c) The probability that a bomb will hit a target is 0.8. Find the probability that out of 10 bombs dropped, exactly 4 will miss the target. [5]

**OR**

- Write a short note on Normal distribution. [6]
  - A coin is tossed six times. What is the probability of obtaining at least four heads. [6]
  - A purchaser of electrical components buys them in lots of size 10. It is his policy to inspect 3 components randomly from a lot and to accept a lot only if all 3 are non - defective. If 30% of the lots have 4 defective components and 70% have only one, what proportion of lots does the purchaser reject? [5]
- Q3)** a) The time until next earthquake occurs in a particular region is assumed to be exponentially distributed with mean 1/2 year. Find the probability that the next earthquake happens. [5]
- within 2 years.
  - After 1½ year.
- b) Define the following: [6]
- Joint Density function.
  - Marginal distribution.
  - Conditional probability distribution.
- c) The joint probability mass function of  $(x, y)$  is given by  $f(x, y) = k(2x + 3y)$ ,  $x = 0, 1, 2, 3$ . Find all marginal distributions. The joint probability distribution of  $(x, y)$  is given bellow. [5]

x \ y	1	2	3
0	3k	6k	9k
1	5k	8k	11k
2	7k	10k	13k

**OR**

- a) If the probability function of a random variable is given by

$$f(x) = \begin{cases} k(1-x^2) & 0 < x < 1 \\ 0 & \text{elsewhere} \end{cases}$$

Find [5]

- i)  $k$  ii)  $f(x)$   
b) If  $x$  follows exponential distribution with mean 120 find  $C$  such that

$$P(x > c) = \frac{1}{3}. \quad [5]$$

- c) Explain the following terms with example with reference to probability distribution  $f(x)$ . [6]  
i) Variance.  
ii) Co - variance of  $x$  &  $y$ .  
iii) Correlation co - efficient.

**SECTION - II**

- Q4)** a) Write a note on point estimation. [5]  
b) A random sample of size 100 is taken from a population whose mean is 60 and variance is 400. Using CLT (Central Limit Theorem), with what probability can we assert that the mean of the sample will not differ from  $\mu = 60$  by more than 4? [6]  
c) Explain the following terms: [6]  
i) Population.  
ii) Random sampling.  
iii) Sample statistics.

**OR**

- a) i) State central limit theorem. [2]  
ii) Prove that  $\bar{x}$  is an unbiased estimator for  $\mu$ . [3]  
b) A random sample of size  $n = 100$  is taken from a population with  $\sigma = 5.1$  given that the sample mean is  $\bar{x} = 21.6$  Construct a 95% confidence interval for the population mean  $\mu$ . [6]  
c) Find the mean and standard deviation of sampling distribution of variances for the population 2, 3, 4, 5 by drawing samples of size two with replacement. [6]



- Q5)** a) Explain the following terms. [6]  
 i) Statistical Hypothesis.  
 ii) Level of Significance.  
 iii) Critical region.
- b) In a sample of 500 parts manufactured by a company, the number of defective parts were found to be 42. The company however claimed that 6% of their product is defective. Is the claim valid? Use 5% l.o.s. (Table value = 1.96) [6]
- c) What are Type I and Type II error? Why Type II error is more significant than Type I error? [5]

**OR**

- a) From the following table, test the hypothesis that the flower colour is independent of flatness of leaves. Use 5% l.o.s. (Table value = 3.841) [6]

	Flat leaves	Curled leaves
White Flowers	99	36
Red Flowers	20	05

- b) Write a short note on student - t distribution. [6]  
 c) Define Chi - square and discuss its uses in testing of Hypothesis. [5]
- Q6)** a) What is the purpose of SQC? What is its meaning and what are the various types of measures? [6]
- b) Ten samples each of size 5 are drawn at regular intervals from a manufacturing process. Their range is given below. Calculate the control limits with respect to R chart. Comment on the state of control. [6]
- |            |   |   |   |   |   |   |   |   |   |    |
|------------|---|---|---|---|---|---|---|---|---|----|
| Sample No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| Range      | 7 | 5 | 7 | 9 | 5 | 8 | 8 | 6 | 7 | 6  |
- (given  $D_3 = 0$ ,  $D_4 = 2.15$ )
- c) Write a short note on mean chart. [4]

**OR**

- a) What is control chart? Name the types of control chart and explain them in brief. [6]  
 b) Write the advantages & limitations of SQC. [6]  
 c) Write a short note on P chart. [4]



**P809 [4066] - 34**

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

**DATA COMMUNICATION AND COMPUTER NETWORKS**

**(2005 Pattern) (Sem. - III) (215004)**

*Time : 3 Hours]*

*[Max. Marks :100*

*Instructions to the candidates:*

- 1) *Answer to the two sections should be written in separate answer books.*
- 2) *Solve any three questions from section I and section II.*
- 3) *Draw the diagram wherever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Use of pockets calculator is allowed.*

**SECTION - I**

- Q1)** a) Differentiate between synchronous and asynchronous transmission modes with suitable example. [8]  
b) Write short note on fiber optic cables and coaxial cables. [8]

**OR**

- Q2)** a) What are different unguided media available explain any one in detail.[8]  
b) What is time division multiplexing? Explain with neat diagram. [8]

- Q3)** a) Write difference between Circuit switching, Message Switching and Packet Switching? [8]  
b) What are different network topologies? Explain any two in brief. [10]

**OR**

- Q4)** a) Define what Open Systems Interconnection (OSI) reference model is. Explain all the layers in detail. Also write difference between OSI reference model and TCP/IP Protocol suite? [12]  
b) Explain working of Sliding Window protocol. [6]

- Q5)** a) Explain the working of slotted ALOHA, with neat diagram. [8]  
b) What are the different Wireless LAN Protocols? Explain any one in detail. [8]

**OR**

- Q6)** a) Explain with example static and dynamic channel allocation system. [8]  
b) Write short note on Asynchronous Transfer Mode (ATM) protocol. [8]

**P.T.O**

## **SECTION - II**

- Q7)** a) What is the difference between Connectionless and Connection-oriented Services? Explain with suitable example. [8]  
b) What are different congestion prevention policies? [8]

**OR**

- Q8)** a) Explain the User Datagram Protocol (UDP) in detail. [8]  
b) Explain the working of IPV 6 protocol. [8]

- Q9)** a) Explain Transmission Control Protocol (TCP) with neat diagram in detail. [8]  
b) List out the services offered by Transport Layer and what are the service primitives of Transport Layer? [8]

**OR**

- Q10)** a) What is a different performance issue of wireless TCP and UDP? [8]  
b) Explain any one congestion control techniques in detail. [8]

- Q11)** a) Write about Domain Name System (DNS) with suitable example of DNS servers. [8]  
b) Explain how electronic mail works and list out the services offered by Simple Mail Transfer Protocol (SMTP). [10]

**OR**

- Q12)** Write Short note on (Any 3) [18]  
a) Static and dynamic web pages.  
b) Internet Control Message Protocol ICMP.  
c) Simple Mail Transfer Protocol SMTP.  
d) Internetworking.  
e) Hyper Text Transfer Protocol HTTP.



P810

[4066] - 23

M.C.A. (Under Faculty of Engineering)

OPERATIONS RESEARCH

(2005 Pattern) (115011) (Sem. - II)

Time : 3 Hours]

[Max. Marks :100

Instructions to the candidates:

- 1) Answer to the two sections should be written in separate answer books.
- 2) Use graph paper wherever is necessary.
- 3) Figures to the right indicate full marks.
- 4) Use of nonprogrammable calculator is allowed only.

**SECTION - I**

- Q1) a) Food 'X' contains 5 units of vitamin 'A' per gram and 12 units of Vitamin 'B' per gram. Food 'Y' contains 10 units of vitamin 'A' per gram and 6 units of vitamin 'B' per gram. Costs of food 'X' and 'Y' are 12 and 20 paise per gram respectively. The daily minimum requirements of vitamin 'A' and 'B' are 100 and 120 units respectively.

Formulate a L.P.P. and find minimum cost of the Food mixture graphically.

[8]

- b) Solve the following L.P.P. by simplex method.

$$\text{Max. } Z = 3x_1 + 2x_2 + 5x_3$$

$$\text{Subject to } x_1 + x_2 + x_3 \leq 9$$

$$2x_1 + 3x_2 + 5x_3 \leq 30$$

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

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

[10]

**OR**

- a) Explain the Linear programming model. What are the advantages and limitations of L.P. model? [8]
- b) Write the dual of following L.P.P. and find its solution using BigM method.[10]

$$\text{Max. } Z = 3x_1 + 2x_2$$

Subject to

$$x_1 + x_2 \leq 4$$

$$x_1 - x_2 \leq 2$$

$$\text{and } x_1, x_2 \geq 0$$

P.T.O

- Q2) a) Following is an initial basic feasible solution of the transportation problem. Is this solution optimal? If not find the optimal solution. [8]

From \ To	A	B	C	D	Supply
X	13	7	19	0	200
Y	17	18	15	7	500
Z	11	22	14	5	300
Demand	180	320	100	400	

- b) Explain Transshipment model with suitable example. [8]

OR

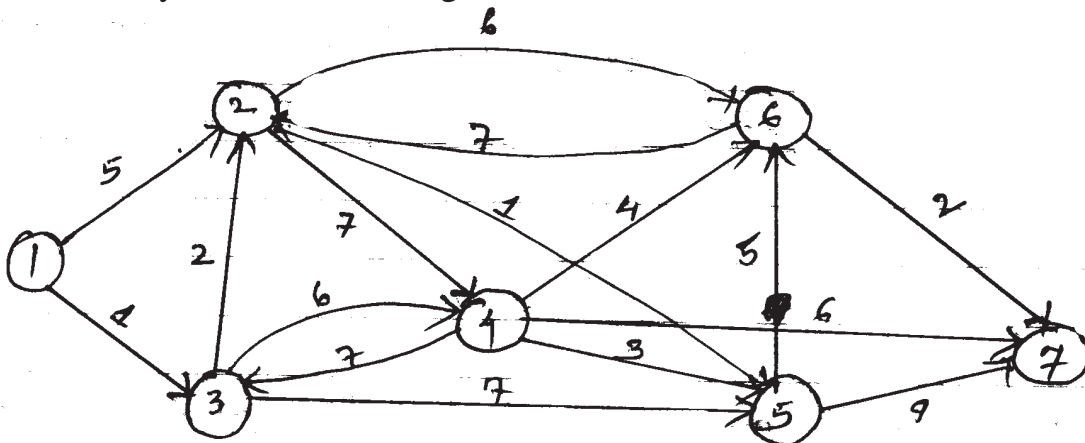
- a) Four different jobs can be done on four different machines. The setup and take-down time costs are assumed to be prohibitively high for change over. The matrix below gives the costs in rupees of producing job 'j' on machine 'j' [8]

Machines \ Jobs	M <sub>1</sub>	M <sub>2</sub>	M <sub>3</sub>	M <sub>4</sub>
j <sub>1</sub>				
j <sub>2</sub>				
j <sub>3</sub>				
j <sub>4</sub>				

How should the jobs be assigned to the various machines, so that the total cost is minimized.

- b) Explain Degeneracy in transportation problem with suitable example. [8]

- Q3) a) Use Dijkstra's algorithm to find the shortest root between node 1 and every other node in the given network. [10]



- b) Define the following terms: [6]
- i) Spanning Tree.
  - ii) Total Float.
  - iii) Critical Activity.

**OR**

- a) Explain the steps of the following algorithms: [10]
- i) Floyd's algorithm.
  - ii) Kruskal's algorithm.
- b) What is PERT? How does it differ from CPM? [6]

**SECTION - II**

- Q4)** a) Write a short note on cutting - plane algorithm. [8]
- b) List the various forecasting models. Fit a straight line trend for the following series using least square method.

Estimate the value for the year 2001. [10]

Year	1994	1995	1996	1997	1998	1999	2000
No. of Production Units	125	128	133	135	140	141	143

**OR**

- a) PC - Soft is a growth oriented firm which establishes monthly performance goals for its sales force. PC-soft determines that the sales force has a maximum available hours per month for visits of 640 Hours. Further, it is estimated that each visit to a potential new client requires 3 hours and each visit to a current client requires 2 hours. PC - soft establishes two goals for the coming month:
- i) contact at least 200 current clients.
  - ii) contact at least 120 new clients overachieving either goal will not be penalized.
- Solve the G.P. [10]
- b) Write short note on algorithms for solving goal programming. [8]

- Q5)** a) Explain types of Decision Making in Brief. [8]
- b) The Probability of demand for lorries for hiring on any day in a given district is as follows:

No. of lorries demanded:	0	1	2	3	4
Probability	0.1	0.2	0.3	0.2	0.2

Lorries have a fixed cost of Rs. 90 each day to keep the daily hire charges (net of variable costs of running) Rs.200. If the lorry - hire company owns 4 lorries, what is its daily expectations? If the company is about to go in business and currently has no lorries, how many lorries should buy? [8]

**OR**

- a) Explain four criterion to analyze the decision making under uncertainty.[8]
- b) Explain decision making under certainty using AHP. [8]

- Q6)**
- a) What is simulation experiment? Discuss the factors affecting simulation.[8]
  - b) Explain the three most common methods for collecting observations in simulation. [8]

**OR**

- a) Write a short note on: [8]
  - i) Monte - carlo simulation.
  - ii) Pseudo - random numbers.
- b) Generate three random numbers based on multiplicative congruential method using  $b = 9, c = 5, m = 12$ , the seed is 11. [8]



**P811**

**[4066] - 53**

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

**ADVANCED DATABASES**

**(315003) (2005 Pattern) (Sem. - V)**

*Time : 3 Hours]*

*[Max. Marks :100*

*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 steps in query processing with diagram. [6]  
b) What are the different ways to execute pipelines? [5]  
c) Explain basic scan algorithms to implement selection operation in query processing. [6]

OR

- Q2)** a) Explain and compare nested loop join and block nested loop join algorithm. [8]  
b) Explain role of "Selection" operation in query processing. [5]  
c) Explain materialization and pipelining with example. [4]

- Q3)** a) State the advantages and disadvantages of distributed system. [5]  
b) Write short notes on: [12]  
i) Parallel database architectures.  
ii) Data Servers.

OR

- Q4)** a) Why distributed database architecture is required? Explain. [5]  
b) Write short notes on: [12]  
i) Centralized database architecture.  
ii) Client server database architecture.

- Q5)** a) Explain structured types and inheritance in SQL with example. [8]  
b) Explain in detail object identity and reference types. [8]

OR

***P.T.O***



- Q6)** a) Explain various ways of making an object persistent. [8]  
b) What is persistent programming and how it is different from embedded language. [8]

**SECTION - II**

- Q7)** a) Discuss the different ways of handling missing values in the data cleaning. [8]  
b) What is meant by OLAP? Explain in brief. [4]  
c) What is a Data warehouse? Explain the key features of Data warehouse. [5]

OR

- Q8)** a) Explain star schema for the multidimensional databases in detail. [8]  
b) Explain in brief the materialized view. [4]  
c) Write short note: Data warehouse architecture. [5]

- Q9)** a) Explain supervised and unsupervised clustering. [5]  
b) Explain in detail following. [12]  
i) K-means algorithm for clustering.  
ii) Text mining.

OR

- Q10)** a) Explain the concept of decision tree. [5]  
b) Explain in detail following: [12]  
i) Outlier analysis.  
ii) Bayesian classifiers.

- Q11)** a) Explain in detail indexing of documents. [7]  
b) Differentiate between [9]  
i) False positive and false drop.  
ii) Precision and recall.  
iii) Synonyms and Homonyms.

OR

- Q12)** a) Explain in detail popularity ranking. [7]  
b) What is meant by web crawlers? [3]  
c) Explain the following terms. [6]  
i) Inverse document frequency.  
ii) Term frequency.  
iii) Page Rank.



**P812** **[4066] - 55**  
**T.Y. M.C.A. (Under Faculty of Engineering)**  
**ARTIFICIAL INTELLIGENCE**  
**(315004 (b)) (2005 Course) (Elective - I)**

*Time : 3 Hours]*

*[Max. Marks :100*

*Instructions to the candidates:*

- 1) *Assume suitable data wherever necessary.*
- 2) *Separate answer books must be used for the sections.*
- 3) *Draw proper diagrams wherever necessary.*

**SECTION - I**

- Q1)** a) Define Artificial Intelligence. Give four applications of it. [8]  
b) Discuss Constraint Satisfaction with an example from Cryptarithmic domain. [10]

**OR**

- Q2)** a) Explain Waiting for Quiescence with example. [8]  
b) Explain Minmax search procedure in detail with proper example. [10]
- Q3)** a) What are the drawbacks of knowledge representation in predicate logic? Discuss with examples. [8]  
b) Write a script for withdrawing the money from ATM. [8]

**OR**

- Q4)** a) Give the complete procedure of resolution with example. [10]  
b) Give the Semantic Network representation for the following statements. [6]  
i) The dog has bitten the mail carrier.  
ii) Every dog in the town has bitten the mail carrier.  
iii) The dog has bitten every mail carrier.

- Q5)** a) Write and explain Waltz's algorithm. [10]  
b) Comment on ATN and RTN parsers used in NLP. [6]

**OR**

***P.T.O***

- Q6)** a) How AI can be used in Speech Processing? Explain in detail. [6]  
b) Explain Natural Language Processing in detail. [10]

**SECTION - II**

- Q7)** a) What is Least Commitment Strategy? Discuss in detail. [8]  
b) What are the various components of Planning? Elaborate. [8]

**OR**

- Q8)** a) Compare Planning and Programming with examples. [8]  
b) Explain Non linear planning with goal stack with example. [8]

- Q9)** a) Discuss Supervised, Unsupervised and Semisupervised Learning in ANN. [9]  
b) Explain Back Propagation Neural Network in detail? [9]

**OR**

- Q10)** a) Write a note on Perceptron Learning in detail. [8]  
b) Write the note on Failure Driven Learning and Learning by Being Told. [10]

- Q11)** a) Write a Prolog program to compute a Fibonacci number. [8]  
b) Explain the typical architecture of Expert System. [8]

**OR**

- Q12)** a) What are the typical characteristics of AI language? Elaborate your answer. [6]  
b) Explain an Expert system to diagnose five childhood diseases. [10]

