

Total No. of Questions : 12]

SEAT No. :

P1014

[4661]-21

[Total No. of Pages : 2

F.Y. M.C.A. (Engineering)
OBJECT ORIENTED PROGRAMMING
(Semester - II) (510909) (2008 Pattern)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

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

SECTION - I

- Q1)** a) What is object oriented programming? List out the differences between C programming language and C++ programming language. [6]
- b) What is procedure oriented programming? Why procedure oriented programming is called top down approach? [5]

OR

- Q2)** a) What is abstraction? Why is it important? Should abstraction be user centric or developer centric. [6]
- b) What is object oriented programming? Why object oriented programming called bottom up approach? [5]

- Q3)** a) What are the advantages of using **new** operator as compared to the function **malloc ()**? Write a program to allocate memory to array using new operator. [6]
- b) What is inline function? List out the situations in which it will not work as inline? [6]

OR

- Q4)** a) What is function overloading? Write a C++ program to overload volume Function that Calculate volume of circle, rectangle, Square. [6]
- b) What is class? Explain difference between structure and class with example. [6]

P.T.O.

- Q5)** a) What is a destructor and what are the uses of declaring a destructor member function in a program? [6]
b) What is friend function? What are the characteristics of friend function? Give one example of friend function. [6]

OR

- Q6)** a) What is a constructor? What are the rules governing the declaration of constructor? [6]
b) Write a c++ program to print the factorial of given number using a constructor and a destructor member function. [6]

SECTION - II

- Q7)** a) Write a program in c++ using operator overloading to overload binary + operator using friend function. [6]
b) Explain binary and unary operator overloading using friend function. [6]

OR

- Q8)** a) What is a type conversion? Explain type conversion from class type to basic type using example. [6]
b) What is the difference between unary and binary operator? List operator overloading rules. [6]

- Q9)** a) Explain mechanism of passing parameters to the base class constructor in inheritance with example. [6]
b) Explain virtual base class and abstract base class with example. [6]

OR

- Q10)** a) What is polymorphism? Explain run time polymorphism with example. [6]
b) What are the different visibility modifiers in inheritance? Explain the effect of inheritance on the visibility of members. [6]

- Q11)** a) What is an exception? Write a program to handle user define exception. [5]
b) List Formatted I/O and unformatted I/O Functions in c++. Explain any two functions of each type. [6]

OR

- Q12)** a) What is Manipulator? Explain user-defined manipulators with example. [5]
b) What is file handling? What are the different file modes in C++? Explain the parameters and their meaning. [6]



Total No. of Questions : 12]

SEAT No. :

P1015

[4661]-22

[Total No. of Pages : 4

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

DATA STRUCTURES AND FILES
(Semester - II) (510910) (2008 Course)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

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

SECTION - I

- Q1)** a) What is Abstract data type (ADT)? Give the difference between ADT and data structure. Explain array as an ADT in detail. [8]
- b) What is sparse matrix? How to represent the sparse matrix? [4]

OR

- Q2)** a) What is array? Explain 2 D array in detail. Consider an array declaration $\text{float } a[20][10]$. If the base address is 3000, find the address of element $a[15][8]$ in row major and column major representation.
(NOTE - Assume 4 byte storage for each array element). [8]
- b) Define the following terms: [4]
- i) Data structure.
 - ii) Data Object.

- Q3)** a) Write a function to delete the node from doubly linked list. [6]
- b) Represent addition of following polynomials in the form of circular linked list. [6]
- i) $A(X) = X^9 - X^4 + X^3 + X - 2$
 $B(X) = 3X^3 - 2X^2 + 7X - 4$
 - ii) $A(X) = 9X^8 - 6X^5 + 2X^2 - 9$
 $B(X) = X^7 + 7X^3 + 4X^2 - 9X + 7$
- (Clearly show the node structure)**

OR

P.T.O.

- Q4)** a) Write a function to reverse a singly linked list. [5]
 b) Differentiate between singly linked list and circular linked list. [3]
 c) Write a function to search a particular element from circular linked list. [4]

Q5) a) What is queue? Give the different types of queue. Represent queue as an array. [6]

b) Convert the following infix expression into postfix form

$$3 + 5 * (7 - 4)^2$$

And also evaluate the postfix expression. [5]

OR

Q6) a) What is stack? Compare stack and queue in two column format. [6]

b) Explain priority queue as linked list. [5]

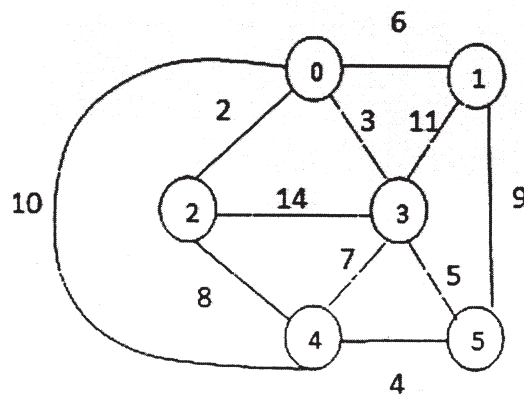
SECTION - II

Q7) a) Construct binary search tree by inserting the following data sequentially. [4]

Also find height of the binary search tree.

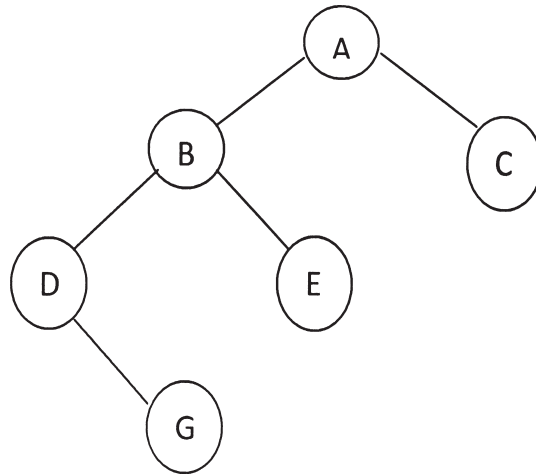
81 62 12 87 45 96 38 29 78 67

b) Construct and plot the minimum spanning tree of the following graph. Assume starting vertex as 0. [8]

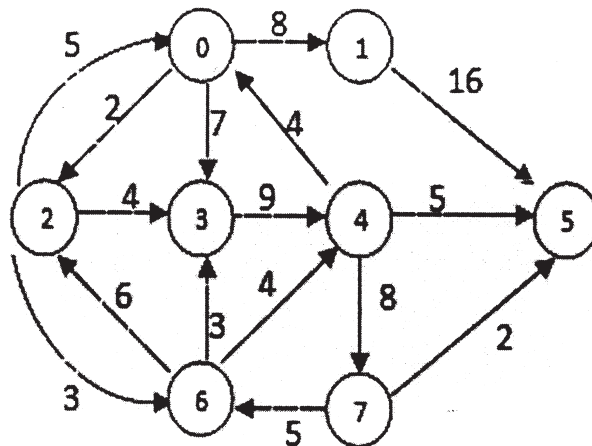


OR

- Q8) a)** What is binary tree? Construct inorder, preorder and post order traversal of following binary tree. **[4]**



- b)** Find the shortest path of the following graph using Dijkstra's algorithm. Assume starting vertex as 0. **[8]**



- Q9) a)** Sort the following list in ascending order using merge sort. Show step by step process.

25, 17, 31, 13, 2, 89, 75, 12, 7, 21 **[6]**

- b)** Write a c program to find the desired element in an array using linear search and compute its time complexity. **[6]**

OR

- Q10)a)** Sort the following list in ascending order using quick sort. Show step by step process. 48, 44, 19, 59, 72, 80, 42, 65, 82, 8, 95, 68. [7]
- b) What is Binary search? Explain with suitable example by computing its time complexity. [5]

- Q11)a)** Write a short note on - “Simple index File organization”. [3]
- b) What is hashing and hash function? Enlist application areas in which hashing are used and also explain good characteristic of hash function. [8]

OR

- Q12)a)** Compare sequential file access and direct file access. [4]
- b) What do you mean collision resolution? Explain various techniques of collision resolution in hashing. [7]



Total No. of Questions : 12]

SEAT No. :

P1016

[4661]-23

[Total No. of Pages : 4

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

OPERATIONS RESEARCH

(2008 Pattern) (510911)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

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

SECTION - I

- Q1) a)** The ABC company has been a producer of picture tubes for television sets and certain printed circuits for radios. The company has just expanded into full scale production and marketing of AM and AM-FM radios. It has built a new plant that can operate 48 hours per week. Production of an AM radio in the new plant will require 2 hours and production of an AM-FM radio will require 3 hours. Each AM radio will contribute Rs.40 to profits while an AM-FM radio will contribute Rs. 80 to profits. The marketing department after extensive research has determined that a maximum of 15 AM radios and 10 AM-FM radios can be sold each week. **[8]**
- i) Formulate a linear programming model to determine the optimum production mix of AM and FM radios that will maximize profits.
 - ii) Solve the above problem using the graphic method.
- b) Discuss the properties of LP Models. **[4]**

OR

Q2) Use the Simplex method to solve the following LPP

a) $\text{Max } Z = 3x_1 + 5x_2 + 4x_3$

subject to constraints

$$2x_1 + 3x_2 \leq 8$$

$$2x_2 + 5x_3 \leq 10$$

$$3x_1 + 2x_2 + 4x_3 \leq 15$$

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

[8]

- b) Give the general structure of LP Model and what are the advantages and limitations of LP Model. **[4]**

P.T.O.

- Q3) a)** Compare the starting solutions obtained by
- Northwest corner method.
 - Least cost method.
 - Vogel's Approximation method for the following method. **[8]**

	D ₁	D ₂	D ₃	D ₄	Supply
P ₁	2	3	11	7	6
P ₂	1	0	6	1	1
P ₃	5	8	15	9	10
Demand	7	5	3	2	

- b)** Write algorithm MODI Method. **[4]**

OR

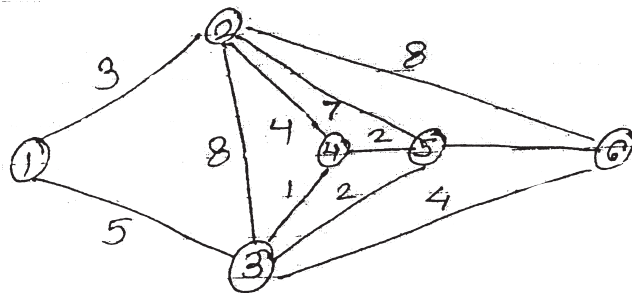
- Q4) a)** A company has a team of Four salesman and there are four districts where the company wants to start it's business. The following is the profit per day in Rupees for each salesman in each district **[8]**

		Districts			
		D ₁	D ₂	D ₃	D ₄
SalesMan	A	16	10	14	11
	B	14	11	15	15
	C	15	15	13	12
	D	13	12	14	15

Find the assignment of Salesman to various districts which will field maximum profit.

- b)** Write a short note on Transshipment model. **[4]**

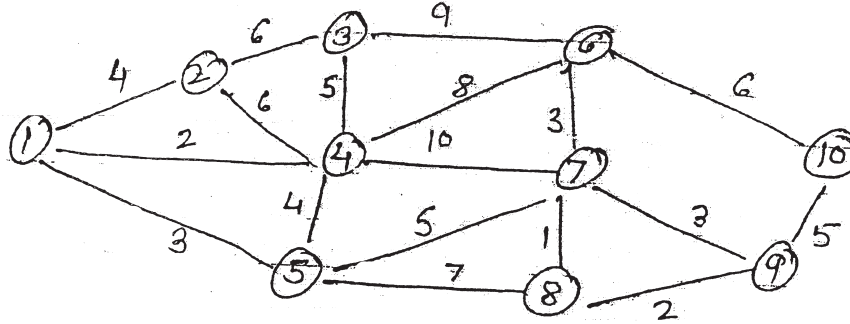
- Q5) a)** **[7]**



- Apply Floyd's algorithm to it and generate the final distance matrix and precedence matrix.
 - Find the shortest path and the corresponding distance from the source node to the destination node in each of the cases
1-6, 5-1 and 5-2
- b)** Compare CPM and PERT. **[4]**

OR

Q6) a)



Consider the distance network. Find the minimum spanning tree of this network using the PRIM algorithm. [7]

b) Write a Algorithm Kruskal's algorithm. [4]

SECTION - II

Q7) a) Solve the following Integer programming problem using Branch Bound technique.

$$\begin{aligned} \text{Max } z &= 10x_1 + 20x_2 \\ \text{Subject to } 6x_1 + 8x_2 &\leq 48 \\ x_1 + 3x_2 &\leq 12 \\ x_1, x_2 &\geq 0 \text{ and integer} \end{aligned} \quad [7]$$

b) Write a cutting plane algorithm. [5]

OR

Q8) a) Find the optimum integer solution to the following LPP. [7]

$$\begin{aligned} \text{Max } z &= 5x_1 + 8x_2 \\ \text{Subject to } x_1 + 2x_2 &\leq 8 \\ 4x_1 + x_2 &\leq 10 \\ x_1, x_2 &\geq 0 \text{ and integer.} \end{aligned}$$

b) List various forecasting techniques. [5]

Q9) a) Estimated levels of sales (units) [8]

Strategies	N ₁	N ₂	N ₃
S ₁	7,00,000	3,00,000	1,50,000
S ₂	5,00,000	4,50,000	0
S ₃	3,00,000	3,00,000	3,00,000

Which strategy should be concern executive choose the basis of

- i) Maximin
- ii) Minimax
- iii) Maximax
- iv) Laplace

b) Give the significance of Decision Analysis what are the steps of decision making process. [4]

OR

- Q10)a)** The research department of ABB has recommended the marketing department. AD launch the shampoo of three different types. The marketing manager has to decide one of the types of shampoo to be launched under the following estimated pay offs for various levels of sales. **[8]**

Types of Shampoo	Estimated levels of sales (unit)		
	Rs. 15,000	Rs. 10,000	Rs. 5,000
Egg shampoo	30	10	10
Clinic shampoo	40	15	5
Deluxe shampoo	55	20	3

What will be the marketing manager's decision.

- i) Maximin
 - ii) Minimax
 - iii) Maximax
 - iv) Laplace
- b) What is decision making under risk? Explain expected value criterion. **[4]**

- Q11)a)** What conditions must be satisfied by the observations of the simulation experiment? Discuss each of them. **[7]**

- b) Explain in brief generation of Random number. **[4]**

OR

- Q12)a)** What is simulation experiment & Discuss the factors affecting simulation. **[7]**

- b) Write a note on Monte Carlo simulation. **[4]**



Total No. of Questions : 12]

SEAT No. :

P1024

[4661]-41

[Total No. of Pages : 2

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

SOFTWARE ENGINEERING

(Semester - IV) (2008 Pattern) (610909) (Theory)

Time : 3 Hours]

[Max. Marks : 70

Instructions to the candidates:

- 1) *Answer three questions from Section - I and three questions from Section - II.*
- 2) *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 role of modeling & construction in software process models? [6]
b) Explain all levels of CMMI. [6]

OR

- Q2)** a) What do you understand by Evolutionary model? Draw and explain any evolutionary model. [6]
b) Explain the concept of process pattern with example. [6]

- Q3)** a) What is software process model? Explain personal and team process models. [6]
b) Explain prototype model? What are the advantages of this model over other models. [6]

OR

- Q4)** a) Explain the importance of coding principles and concepts. [8]
b) Explain Hatley-Pirbhai Modeling with an example. [4]

- Q5)** a) What are the importance of software principles and practices? Explain any two practices. [8]
b) Draw a Swim lane diagram for railway reservation systems. [3]

OR

- Q6)** a) Describe the Class Responsibility collaboration model with example. [8]
b) Explain the Scenario-based Analysis for requirement engineering. [3]

P.T.O.

SECTION - II

- Q7)** a) What are the goal of requirement engineering? What do you mean by functional and non functional requirements? [6]
- b) Explain Golden Rules for Interface Design. [6]

OR

- Q8)** a) Explain the following of The Design Model:
- i) Architectural design elements [3]
- ii) Interface design elements [3]
- b) What do you mean by modularity? What is its contribution towards achieving a good quality software? [6]

- Q9)** a) List all software testing methods. Explain any one in brief. [6]
- b) Explain in brief verification and validation. [5]

OR

- Q10)**a) Explain the two ways of system testing. [6]
- b) How the software testing can be carried out by using object oriented approach? Explain its various methods. [5]

- Q11)**a) Write a note on: [6]
- i) Orthogonal Array testing
- ii) Basic path testing
- b) What is the main aim of software maintenance? Explain with software metric for maintenance. [6]

OR

- Q12)**a) What do you mean control structural testing? Explain its various types. [6]
- b) What are the attributes of effective software metric? Explain measure, measurement and metrics. [6]



Total No. of Questions : 12]

SEAT No. :

P1025

[4661]-42

[Total No. of Pages : 3

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

WEB TECHNOLOGY

(Semester - IV) (610910) (2008 Pattern)

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 answer books.*
- 4) *Neat diagrams must be drawn wherever necessary.*
- 5) *Figures to the right indicate full marks.*
- 6) *Make suitable assumptions, wherever and relevant.*

SECTION - I

- Q1) a)** State whether the following are true or false: **[2]**
- i) The IP Address consists of two parts Network number and host number.
 - ii) All web servers use port 80 to listen for server response.
- b)** Comment on and explain: **[6]**
- i) Telnet can actually be used to send HTTP commands to a web server.
 - ii) To improve the performance of HTTP Byte serving is used in it.
- c)** Explain the role of middleware in the web development models. **[4]**

OR

- Q2) a)** Differentiate between static & Dynamic web sites with a suitable example. **[6]**
- b)** Explain the execution of dynamic web pages stepwise in details with a suitable diagram. **[6]**

P.T.O.

- Q3)** a) Design an HTML form to generate an E-book. First the user should be the registered user of that web site. Then check whether the book is free to download. If not then proceed to purchase that book online. [7]
- b) Explain the syntax of a rule in CSS with a suitable example. [4]

OR

- Q4)** a) Explain how a web server can be made dynamic? [5]
- b) Explain the concept of classes in CSS with a suitable example. [6]

- Q5)** a) What is the Error object in VBScript? Explain its properties and methods. [4]
- b) Write a program in VBScript for designing a simple calculator. Assume appropriate data for the design. [8]

OR

- Q6)** a) Compare: [6]
- i) VBScript and JavaScript.
 - ii) ASP and JSP.
 - iii) For...Next and For...Each...Next statements in VBScript.
- b) Explain two kinds of procedures in VBScript. [6]

SECTION - II

- Q7)** a) Explain the concept of DOM in Javascript with all objects & their important properties and methods with a suitable diagram. [8]
- b) Write a short note on Event handling in javascript. [4]

OR

- Q8)** a) What is cookie? How it is created and read? Describe difference between Cookie and session? [6]
- b) Explain Alert, confirm, and prompt functions in Javascript with a suitable example. [6]

- Q9)** a) Explain the client server communication of AJAX Technology. [6]
b) Explain the various stages of Life cycle of JSP page. [5]

OR

- Q10)** a) What is JSP Directives? Explain the types of Directives. [6]
b) What is AJAX? Explain the AJAX model & explain how it works. [5]

- Q11)** a) Explain the Framework of ASP .net. [6]
b) Write Short note on: [6]
i) View state
ii) Compare ASP and ASP.Net

OR

- Q12)** a) Explain the types of ASP.net validation controls. [6]
b) Explain the architecture of ADO.net. [6]

