

Total No. of Questions : 8]

SEAT No. :

P2539

[Total No. of Pages : 3

[5234]-101

M.C.A. (Science Faculty) (Semester - I)

PROGRAMMING WITH 'C'

(2013 Pattern)

*Time : 3 Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Attempt any five questions out of eight.*
- 2) *All questions carry equal marks.*
- 3) *figures to right indicate full marks.*

**Q1)** Attempt the following:

- a) Explain the use of getchar(), getch(). and getche() with an example. [4]
- b) Explain malloc () and calloc () function with example . [4]
- c) What are the use of conditional operator. [2]

**Q2)** Attempt the following :

- a) What is pointer? What are the different operations that can be performed on pointer. [4]
- b) Write a 'C' program to count number of words and number of lines in given text file. [4]
- c) Trace out the output of following program  
int main () [2]  
{Printf ("%x",-1<<1); getchar ();  
return (0); }

**Q3)** Attempt the following :

- a) Explain the use of fprintf () and fscanf () with suitable example. [4]
- b) Write a 'C' program to calculate sum of digits of given number (Use recursive function). [4]
- c) "C Performs bound checking for an array" state whether true / false with justification. [2]

**P.T.O**

**Q4)** Attempt the following :

- a) Write down difference between 'do while' and 'while loop with example. **[4]**
- b) Write a 'C' Program using structure to store information of teachers with the following attributes, names, subject teaching name, Salary. calculate average salary of teachers. **[4]**
- c) Explain limitations of an Array. **[2]**

**Q5)** Attempt the following :

- a) Write a note on Bitwise operator. **[4]**
- b) Explain enum and typedef with an example. **[4]**
- c) Write down syntax for following functions. **[2]**
  - i) Rectangle
  - ii) Arc.

**Q6)** Attempt the following :

- a) What is function? Explaining it in details. **[4]**
- b) Write 'C' program to sort an array of 'n' integers numbers in descending order . **[4]**
- c) Write the output of the following program : **[2]**

```
main ()
{
    int i = 10;
    int * j, **k;
    j = & i, k = & j ;
    printf ("%d%d %d/n", i, * j, **k);}
```



Total No. of Questions : 8]

SEAT No. :

P2540

[Total No. of Pages : 3

[5234]-102

**M.C.A. - I (Science Faculty) (Semester - I)**

**COMPUTER SCIENCE**

**CS - 102 : Database Management System**

**(2013 Pattern)**

*Time : 3 Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Assume appropriate data, if necessary.*

**Q1)** Attempt each of the following:

- a) What are the disadvantages of file-oriented system. **[4]**
- b) Explain structure of a DBMS. **[4]**
- c) Define Candidate key, NULL value **[2]**

**Q2)** Attempt each of the following :

- a) Explain different states of a transaction with diagram. **[4]**
- b) What is lossless join decomposition? Explain with suitable example. **[4]**
- c) Explain how to test VIEW serializability. **[2]**

**Q3)** Attempt each of the following :

- a) Consider the following non-serial schedule. Is this schedule serializable to a serial schedule  $\langle T1, T2 \rangle$ ? **[4]**

T1	T2
Read (X)	
$X = X - N$	
	Read (X)
	$X = X + N$
Write (X)	
Read (Y)	
	Write (X)
$Y = Y + N$	
Write (Y)	

**P.T.O**

- b) Explain Armstrong's axioms required to compute  $F^+$ . [4]
- c) What is query language? State any two categories of it. [2]

**Q4)** Attempt each of the following :

- a) What is Canonical cover? State the procedure to compute it. [4]
- b) Explain recoverable schedule and cascades schedule with example. [4]
- c) Define COMMIT, ROLLBACK [2]

**Q5)** Attempt each of the following :

- a) State and Explain Thomas' write Rule. [4]
- b) Explain multivalued dependency with its user. [4]
- c) What is lock? Explain types of locks. [2]

**Q6)** Attempt each of the following :

- a) What is RAID? Explain different levels of RAID [4]
- b) What are advantage of DBMS? [4]
- c) Define primary key, Reference key. [2]

**Q7)** Attempt each of the following :

- a) Explain the concept of Multiple Granularity Locking. [5]
- b) Explain ACID properties of transaction in detail. [5]

**Q8)** Attempt each of the following :

- a) A reputed general hospital has decided to computerize their system. In the hospital many doctors are working . Personal information of doctors are maintained. The patients are admitted to the hospital into the room. They are treated by various doctors. Sometimes patients perform certain pathological tests which carried out into the labs.  
Draw E-R Diagram for the information system design. [5]

- b) The following is, list of events in an interleaved execution of set of transactions  $T_1, T_2, T_3$  with two phase locking protocol. [5]

Time	Transaction	Code
$t_1$	$T_1$	Lock (A,X)
$t_2$	$T_2$	Lock (B,S)
$t_3$	$T_3$	Lock (A,S)
$t_4$	$T_1$	Lock (C,X)
$t_5$	$T_2$	Lock (D,X)
$t_6$	$T_1$	Lock (D,S)
$t_7$	$T_2$	Lock (C,S)
$t_8$	$T_3$	Lock (B,S)

Construct a wait - for graph according to above request is there deadlock at any instance? Justify.



Total No. of Questions : 8]

SEAT No. :

P2541

[Total No. of Pages : 3

[5234]-103

M.C.A. (Science Faculty) (Semester - I)

COMPUTER SCIENCE

CA - 103 : Mathematical Foundations

(2013 Pattern)

*Time : 3 Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Solve any five questions out of eight questions.*
- 2) *figures to the right side indicate full marks.*
- 3) *Use of non-programmable scientific calculator is allowed.*

**Q1)** Attempt each of the following :

- a) Let A and B subsets of universal set  $\mathcal{U}$  then show that [4]

$$(A - B) \cup (B - A) = (A \cup B) - (A \cap B) \text{ and check this when}$$

$$A = \{1,2,3,4,5,6,\} \text{ and } B = \{4,5,6,7,8,9\}$$

- b) Let A,B and C be finite sets then show that [4]

$$|A \cup B \cup C| = |A| + |B| + |C| - |A \cap B| - |A \cap C| - |B \cap C| + |A \cap B \cap C|$$

- c) Give an example of reflexive but not symmetric. [2]

**Q2)** Attempt each of the following :

- a) Let  $f : R \rightarrow R, f(x) = 4x - 1$  and  $g : R \rightarrow R, g(x) = \sin x$ . [4]

Find (fog) (x) and (gof) (x).

**P.T.O**

b) Let  $A = \{X \in \mathbb{R}^+ | x < 6\}$  and  $B = \{X \in \mathbb{R} | (x - 2)(x + 1)(x - 5) = 0\}$  [4]

Find  $A \times B$

c) Let  $A = \{1, 2, 3, 4, 12\}$ . Consider the partial order of divisibility on A that is, if a and b  $\in A$ ,  $a \leq b$ , if and only if  $a/b$ . Draw the Hasse diagram of the poset  $(A, \leq)$  [2]

**Q3)** Attempt each of the following :

a) Show that  $(P \rightarrow Q) \leftrightarrow ((\neg P) \vee Q)$  is a tautology. [4]

b) Write the following statements in terms of p,q,r and logical connectives. [4]

i) Either  $4 > 1$  or  $4 < 5$

ii) If  $3 \geq 3$  then  $2 > 2$

iii) It is not the case that  $2 > 2$  or  $4 > 1$

c) Give the negation of each of the following statements. [2]

i) It will rain tomorrow or it will snow tomorrow

ii) If you drive, then I will walk.

**Q4)** Attempt each of the following :

a) Prove that there is no rational  $p/q$  whose square is 2. [4]

b) Prove that.  $(P \rightarrow R) \wedge (Q \rightarrow R) \equiv (P \vee Q) \rightarrow R$  [4]

c) Let  $p(x)$  be the assertion "x is odd", and let  $Q(x)$  be the assertion " $x^2 - 1$  is divisible by 8" [2]

Determine whether the statement.

$(\forall x \in \mathbb{Z}) [P(x) \Rightarrow Q(x)]$  is true.

**Q5)** Attempt each of the following :

a) Find G.C.D of polynomials  $f(x) = x^4 - x^3 - 2x + 2$  and  $g(x) = x^3 + x - 2$ . [4]

b) Find the cubic polynomial which vanishes at  $x = 2, -1$  and has value  $-20$  at  $-2$  and  $-14$  at  $x = 1$ . [4]

c) Use Remainder Theorem to find remainder when  $x^5 + 3x^4 + 5x^2 - 2$  is divided by  $x - 3$ . [2]

**Q6)** Attempt each of the following :

- a) Prove that 3 divides  $4^n - 1$ , for every positive integer n. [4]
- b) Find the remainder of  $8^{401}$ , when divided by 13 [4]
- c) If a,b are relatively prime and both divide n, then  $ab/n$ . [2]

**Q7)** Attempt each of the following :

- a) Let  $f = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 4 & 7 & 6 & 5 & 1 & 3 & 2 \end{pmatrix}$ ,  $g = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 2 & 7 & 5 & 4 & 3 & 1 \end{pmatrix}$  be permutations in  $S_7$  then compute  $g^{-1}fg$  [5]
- b) Find GCD of 224 and 126 and express it in the form  $d = 224m + 126n$  for some  $m, n \in \mathbb{Z}$  [5]

**Q8)** Attempt each of the following :

- a) Solve the following system of equations by gauss - elimination method [5]

$$\begin{aligned}x - y + 5z &= 0 \\3x - 2y - z &= 0 \\x - 5y + 2 &= 0\end{aligned}$$

- b) Find inverse of the matrix (if exist) [5]

$$A = \begin{bmatrix} 2 & -1 & 3 \\ 4 & 0 & 1 \\ 2 & 1 & 2 \end{bmatrix} \text{ by adjoint method.}$$



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SEAT No. :

P2542

[Total No. of Pages : 5

[5234]-104

**M.C.A. (Under Science Faculty) (Semester - I)**  
**CA - 104 : Concrete Mathematics and Graph Theory**  
**(2013 Pattern)**

*Time : 3 Hours]*

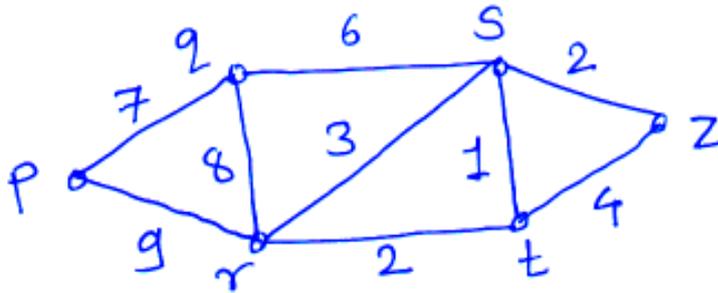
*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Attempt any five questions out of eight.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of single - memory non-programmable scientific calculator is allowed.*

**Q1) Attempt each of the following :** **[4]**

- a) Solve the following recurrence relation  $a_r = 2a_{r-1} - a_{r-2}$ ;  $a_0 = a_1 = 2$ .
- b) Using kruskal's algorithm find minimal spanning tree of the following connected graph. **[4]**



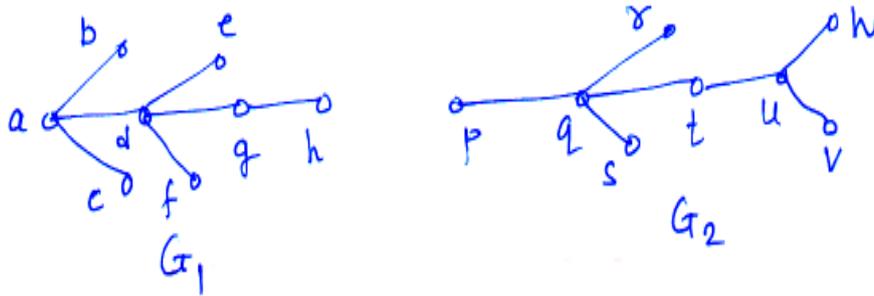
- c) State Max - flow cut theorem. **[2]**

**Q2) Attempt each of the following :** **[4]**

- a) Find g.c.d. of 191 and 253. Also express it in the form  $191m + 253n$ , where  $m, n \in \mathbb{Z}$ .

**P.T.O**

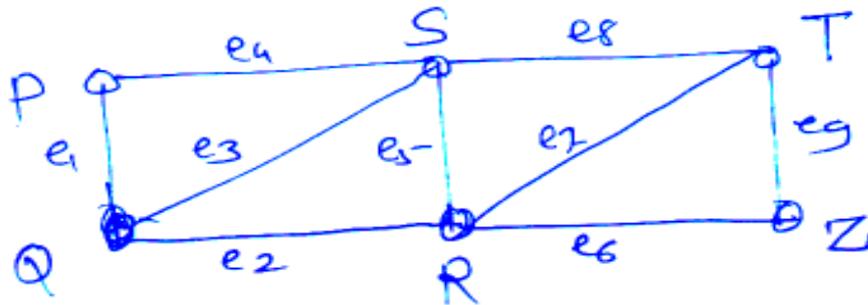
- b) Determine whether the following two graphs are isomorphic or not. [4]



- c) Draw a 2 - regular graph on 4-vertices. [2]

Q3) Attempt each of the following : [4]

- a) Using fleury's algorithm find Euler tour in the following connected graph.



- b) Draw the arboresece corresponding to the following expressions and write the polish notation. [4]

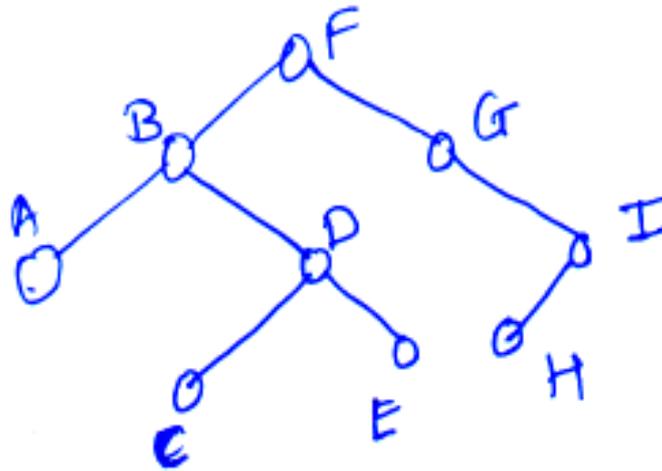
$$((x + y) \uparrow 2) + ((x - 4) / 3)$$

- c) Draw a graph whose adjacency matrix is given below. [2]

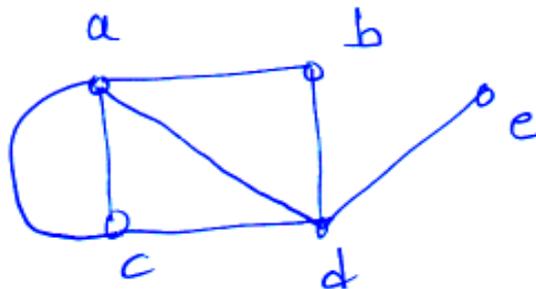
$$\begin{matrix} & \begin{matrix} a & b & c & d \end{matrix} \\ \begin{matrix} a \\ b \\ c \\ d \end{matrix} & \begin{bmatrix} 1 & 0 & 2 & 1 \\ 0 & 1 & 1 & 1 \\ 2 & 1 & 0 & 1 \\ 1 & 1 & 1 & 0 \end{bmatrix} \end{matrix}$$

**Q4)** Attempt each of the following :

- a) If  $C$  is a cutset of a connected graph  $G$  then prove that  $C$  contains at least one branch of every spanning tree. [4]
- b) Obtain preorder and postorder traversal for the following binary tree. [4]



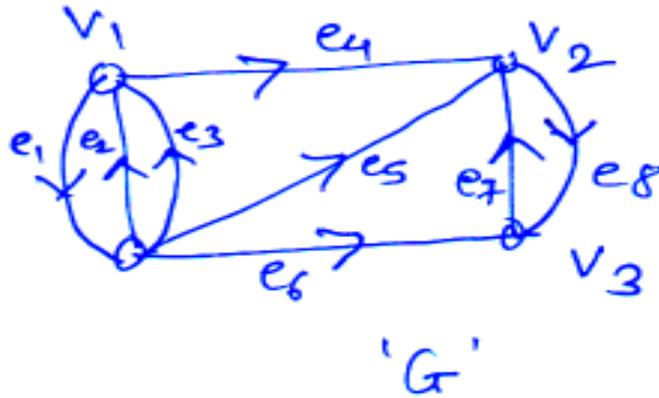
- c) Fuse the vertices 'b' and 'e' at point d. [2]



**Q5)** Attempt each of the following :

- a) Define : [4]
  - i) Chromatic Index
  - ii) Planar graphgive example of each.

- b) Find the remainder when  $8^{401}$  is divided by 13. [4]
- c) Draw any two directed paths from vertex  $V_1$  to  $V_3$  in the following graph. [2]



Q6) Attempt each of the following :

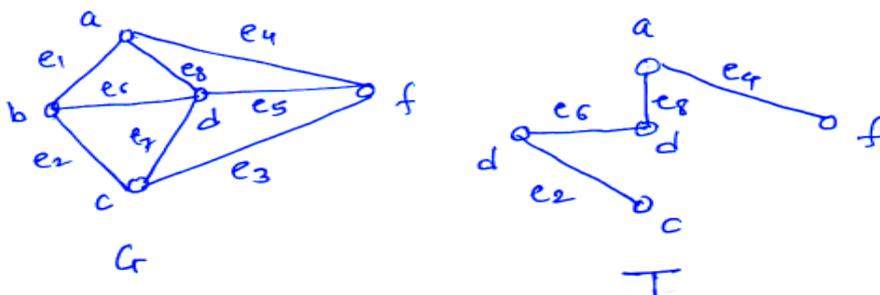
- a) Find particular solution of the following recurrence relation.

$$a_{r+2} + 2a_{r+1} + a_r = 9 \cdot 2^r, a_0 = 2, a_1 = 4 \quad [4]$$

- b) Prove that, in a tree there exist only one path between every pair of vertices. [4]
- c) Define : Binary tree with example. [2]

Q7) Attempt each of the following :

- a) Find the fundamental circuits of graph G with respect to tree T. [5]



b) Encrypt the message 'FORGIVE ME' using a Caesar cipher. [5]

**Q8)** Attempt each of the following :

a) Explain RSA - cryptosystem. [5]

b) Prove that  $K_{3,3}$  is non - planar graph [5]



Total No. of Questions : 8]

SEAT No. :

P2543

[Total No. of Pages : 2

[5234]-105

M.C.A. (Science Faculty) (Semester - I)

CA - 105 : COMPUTER ORGANIZATIONS

(2013 Pattern)

*Time : 3 Hours]*

*[Max. Marks :50*

*Instructions to the candidates:*

- 1) *Attempt any five questions from eight.*
- 2) *All questions carry equal marks.*
- 3) *figures to the right side indicate full marks.*

**Q1)** Attempt the following:

**[4 + 4 + 2 = 10]**

- a) Differentiate MUX and DMUX.
- b) Explain Encoder in details.
- c) Define virtual memory.

**Q2)** Attempt the following :

**[4 + 4 + 2 = 10]**

- a) What is interrupt? Explain need of IVT.
- b) Draw logic diagram of 3 to 8 decoder using basic gates and explain its working.
- c) What is relation between number of inputs and number of address lines in multiplexer? How many address lines required for 4 : 1 mux?

**Q3)** Attempt the following :

**[4 + 4 + 2= 10]**

- a) Explain the concept of stack Which are the instructions and registers related with load & unload of data
- b) Explain concept of flip flop and discuss need of clock in detail.
- c) Implement NOT and AND gate Using NAND gates only.

**P.T.O**

**Q4)** Attempt the following : **[4 + 4 + 2 = 10]**

- a) Explain segmentation in detail.
- b) Explain the function of CPU in microcomputer system.
- c) Explain working of full adder with its diagram.

**Q5)** Attempt the following : **[4 + 4 + 2 = 10]**

- a) State and prove De-Morgan's theorem.
- b) What is purpose of Parallel processing? Give one example.
- c) What is DMA?

**Q6)** Attempt the following : **[4 + 4 + 2 = 10]**

- a) Explain with block diagram & functions of blocks of numeric co-processor.
- b) Explain working of UART with block diagram.
- c) Explain with block diagram of ALU.

**Q7)** Attempt the following : **[5 + 5 = 10]**

- a) Explain paging in details.
- b) Draw circuit diagram of 4 - bit R - 2 R ladder network DAC & Explain its working.

**Q8)** Attempt the following : **[5 + 5 = 10]**

- a) Compare RISC and CISC architecture.
- b) Using k-map simplifies following expression and draw simplified logic diagram.

$$F(A, B, C, D) = A'BCD + ABC'D + ABCD + A'B'CD.$$



Total No. of Questions : 8]

SEAT No. :

P2544

[Total No. of Pages : 3

[5234]-201

M.C.A. - I (Science Faculty)

CA - 201 : DATA STRUCTURE

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempt any 5 of the following 8 questions.
- 2) All questions carry equal marks.
- 3) Figures to the right indicate full marks.

Q1) Attempt all of the following :

[4+4+2=10]

- a) What is circular queue? Explain its advantage.
- b) Evaluate following postfix expression using stack.  
 $ABC + - CDB | + * B\$C +$   
Consider  $A = 6, B = 2, C = 3$  &  $D = 9$
- c) What is queue?

Q2) Attempt all of the following :

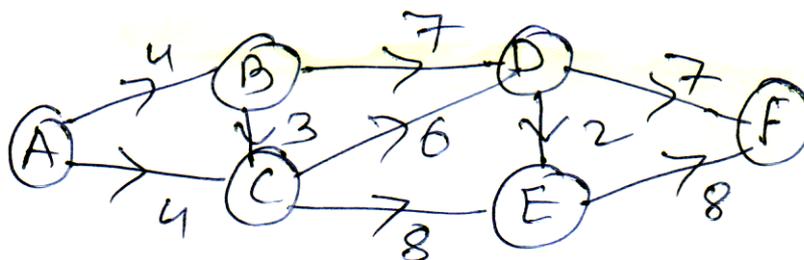
[4+4+2=10]

- a) Sort the following data using heap sort.  
24, 35, 18, 9, 46, 70, 48, 23, 78, 12, 95
- b) Explain stack with it's applications.
- c) Define term
  - i) Inorder
  - ii) Postorder

Q3) Attempt all of the following:

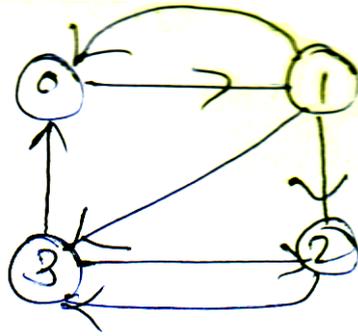
[4+4+2=10]

- a) Find critical path for following graph:



P.T.O.

- b) Write 'C' function to implement singly linked list.
- c) Find adjacency list for following graph



**Q4)** Attempt all of the following :

**[4+4+2=10]**

- a) Sort the following data using quick sort.  
20, 54, 48, 38, 12, 92, 87, 08
- b) Explain Hashing.
- c) Define the term
  - i) Primitive data structure
  - ii) Stack

**Q5)** Attempt all of the following :

**[4+4+2=10]**

- a) Explain graphically, various situations to insert an item to circular linked list.
- b) Define the terms :
  - i) Adjacency matrix
  - ii) Adjacency list
  - iii) Degree
  - iv) Spanning tree
- c) What is BFS?

**Q6)** Attempt all of the following :

**[4+4+2=10]**

- a) Write a 'C' function to insert, delete data from queue.
- b) Convert infix expression to postfix expression using stack.  
 $A \cap B * C / (D * E - F)$
- c) What is malloc () and calloc ()

**Q7)** Attempt all of the following :

**[5+5=10]**

- a) Explain Dijkstra's algorithm with example of any weighted graph.
- b) Construct AVL tree for following data:  
22, 33, 11, 10, 5, 1, 44, 3, 24, 23

**Q8)** Attempt all of the following :

**[5 + 5 = 10]**

- a) Write 'C' function to create graph & insert edge in it.
- b) Construct AVL tree by inserting following values sequentially.  
23, 34, 12, 11, 6, 2, 45, 4, 25, 24



Total No. of Questions : 8]

SEAT No. :

P2545

[Total No. of Pages : 3

[5234]-202

M.C.A. (Science Faculty)

COMPUTER SCIENCE

CA - 202 : Theoretical Computer Science  
(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempt any 5 out of 8 questions.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.
- 4) All questions carry equal marks.

Q1) Attempt the following :

- a) Construct DFA to accept all strings over {a,b,c} which ends with bc and do not have substring cab. [4]
- b) Check whether  $L = \{a^n b^m c^n / n, m \geq 1\}$  is regular. Justify your answer [4]
- c) Define [2]
  - i) Alphabet
  - ii) Power set

Q2) Attempt the following :

- a) Convert following RE to FA [4]  
 $0^* . 1 [(10)^* + (01)^*]^+$
- b) Convert following grammar into GNF [4]  
 $S \rightarrow AB / BA$   
 $A \rightarrow SB / a$   
 $B \rightarrow aA / b$
- c) State pumping lemma for CFL [2]

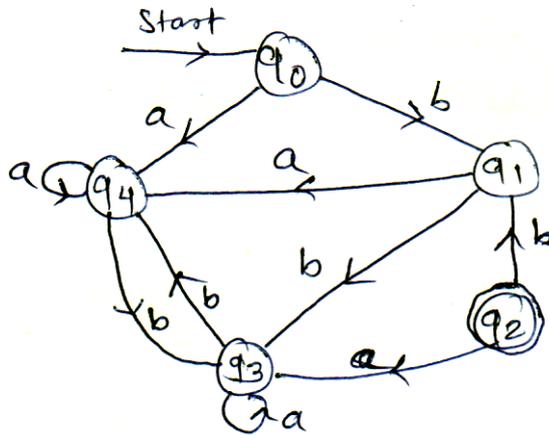
Q3) Attempt the following :

- a) Construct Turing Machine for  $L : \{a^n b^{2n} / n \geq 1\}$  [4]
- b) Construct CFG for  $L : \{a^n b^{n+1} / n \geq 1\}$  [4]
- c) State any two properties of regular sets. [2]

P.T.O.

Q4) Attempt the following :

a) Minimize the given DFA [4]



b) Construct PDA for given CFG [4]

$S \rightarrow aAA$

$A \rightarrow aS/bS/a$

c) Define Turing Machine [2]

Q5) Attempt the following :

a) Convert the following grammar to CNF [4]

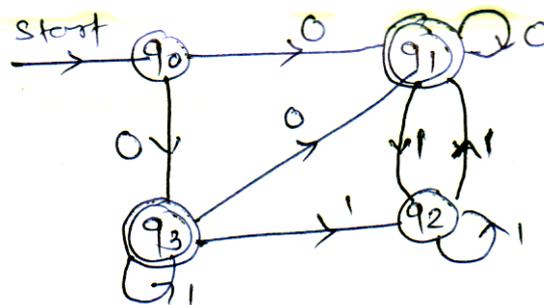
$S \rightarrow aAb / AaBc$

$A \rightarrow aBc / aC/a$

$B \rightarrow b$

$C \rightarrow bAb/c$

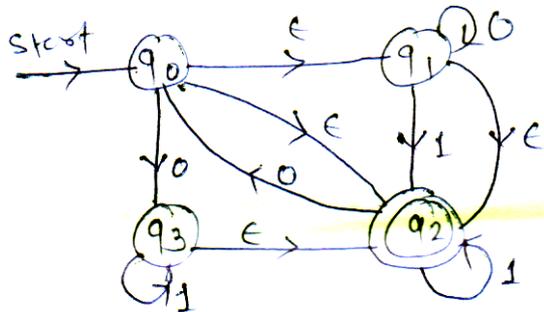
b) Convert given NFA to DFA [4]



c) Construct regular expression for  $L : \{p, q, r\}$  which accepts all string with substring  $qqr$ . [2]

**Q6)** Attempt the following

- a) Construct Moore machine for language  $L : \{x, y, z\}$  which generate output P when reads string ending with yxz, Q when reads string ending with xxz & R otherwise [4]
- b) Convert given NFA with E moves to NFA without E moves [4]



- c) Rewrite following grammar by eliminating E productions [2]  
 $S \rightarrow PQR \mid aPbQ$   
 $P \rightarrow bRS$   
 $Q \rightarrow PQc/PR$   
 $R \rightarrow E$

**Q7)** Attempt the following

- a) Construct PDA for  $L : \{a^n b^{n+1}/n \geq 1\}$  [5]
- b) Write a note on Chomsky Hierarchy [5]

**Q8)** Attempt the following :

- a) Construct Mealy machine for  $L : \{0,1\}$  which generates residue modulo 5 as output. [5]
- b) Write a note on properties of CFL [5]



Total No. of Questions : 8]

SEAT No. :

P2546

[Total No. of Pages : 3

[5234]-203

M.C.A. (Science Faculty) (Semester - II)

CA - 203 : OBJECT ORIENTED PROGRAMMING

(C++ PROGRAMMING)

(2013 Pattern)

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions from the following.*
- 2) *Figures to the right indicate full marks.*

**Q1)** Attempt all of the following :

**[4+4+2=10]**

- a) What are the advantages of object oriented programming
- b) What is virtual function. Explain with example.
- c) What is data encapsulation?

**Q2)** Attempt all of the following :

**[4+4+2=10]**

- a) Explain stream class hierarchy.
- b) What are templates. Explain with examples.
- c) What is data hiding?

**Q3)** Attempt all of the following :

**[4+4+2=10]**

- a) Compare write( ) and read( ) file functions
- b) Write a C++ program to overload << and >> for class string.
- c) Define this pointers

**Q4)** Attempt all of the following :

**[4+4+2=10]**

- a) Write a C++ program which take emp\_code & ename as input and display it using pure virtual functions.
- b) Explain constructor in derived class
- c) What is file

*P.T.O.*

**Q5)** Attempt all of the following :

**[4+4+2=10]**

- a) Write difference between a structure and class with example.
- b) Explain Hierarchical Inheritance with example.
- c) "A function can be declared as private" State and Justify.

**Q6)** Attempt all of the following :

**[4+4+2=10]**

- a) Write short note on runtime polymorphism
- b) Write C++ program to read a file which contain alphabets. Also display count of vowels and consonants from file.
- c) Trace and Explain the output for following:

```
#include<iostream.h>

Class Test
{
    public :
    Test ( )
    {
        Cout << "Constructor" << endl;
    }
    ~ Test ( )
    {
        Cout << "destructor" << endl;
    }
};

void main ( )
{
    Test t1;
    Test t2, t3;
    Test t4;
}
```

**Q7)** Attempt all of the following : **[5+5=10]**

- a) Give any two way to check the success or failure of a file open operation.
- b) What is the purpose of forward declaration of a class.

**Q8)** Attempt all of the following : **[5+5=10]**

- a) Write a C++ program for class INTEGER with data members-int \*ptr, int n. Implement dynamic constructors and destructors. Also implement a member function maximum( ) to find the maximum element from n integers. Write main function to test above functions.
- b) Write a program to overload function to add two integers, two floats and two arrays.



Total No. of Questions : 8]

SEAT No. :

P2547

[Total No. of Pages : 2

[5234]-204

M.C.A. I (Under Science Faculty)

CA - 204 : COMPUTER NETWORKS

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answer any five questions from eight.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figures to right side indicate full marks.
- 4) Assume suitable data if necessary.

Q1) Attempt all of the following :

- a) Write short Note on token passing & polling. [4]
- b) What is fast ethernet? [4]
- c) Find out Class, Netid ,Hostid for IP address - 132.7.21.84 [2]

Q2) Attempt all of the following :

- a) What are service primitives. Explain it with diagram. [4]
- b) What is addressing ? what are its types. [4]
- c) Define : i) Throughput ii) Latency [2]

Q3) Attempt all of the following :

- a) Explain 1-persistent, P- persistent and non-persistent CSMA. [4]
- b) What are characteristics of line coding? [4]
- c) Give structure of WWW. [2]

Q4) Attempt all of the following :

- a) Write Short Note on flow control and error control mechanism in TCP.[4]
- b) Explain NAT? [4]
- c) Define with example [2]
  - i) Bit Stuffing
  - ii) Byte Stuffing

P.T.O.

**Q5)** Attempt all of the following :

- a) Explain LAN in detail. [4]
- b) Construct CRC message for a given bitstream 110010101 and generator polynomial  $x^4 + x^2 + 1$ . [4]
- c) Define [2]
  - i) Browser
  - ii) Cookies

**Q6)** Attempt all of the following :

- a) Explain architecture of wireless Lan [4]
- b) How network layer deals with logical addressing [4]
- c) What is data communication? Give any 2 characteristics. [2]

**Q7)** Attempt all of the following :

- a) Write short note on transmission impairments. [5]
- b) What are advantages of IPV6 over IPV4. [5]

**Q8)** Attempt all of the following :

- a) Compare between TCP and UDP. [5]
- b) What is DNS? How does it works? [5]



Total No. of Questions : 8]

SEAT No. :

P2548

[Total No. of Pages : 3

[5234]-205

M.C.A. (Science)

CA - 205 : ADVANCED DATABASE MANAGEMENT SYSTEM

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) All questions carry same marks.
- 2) Attempt any five questions.

**Q1)** Answer following questions.

- a) Explain data replication in details. [4]
- b) What are characteristic of spatial database [4]
- c) What is mean by objects [2]

**Q2)** Answer following questions.

- a) Briefly explain multimedia queries. [4]
- b) State advantages and disadvantages of OODBMS [4]
- c) What is mean by MAC. [2]

**Q3)** Answer following questions.

- a) Compare object definition languages (ODL) and Object Query Languages (OQL) [4]
- b) Explain parallel database architecture. [4]
- c) State authentication. [2]

**Q4)** Answer following questions.

- a) Differentiate parallel and distributed database. [4]
- b) Explain goals of database security. [4]
- c) What is mean by object attributes. [2]

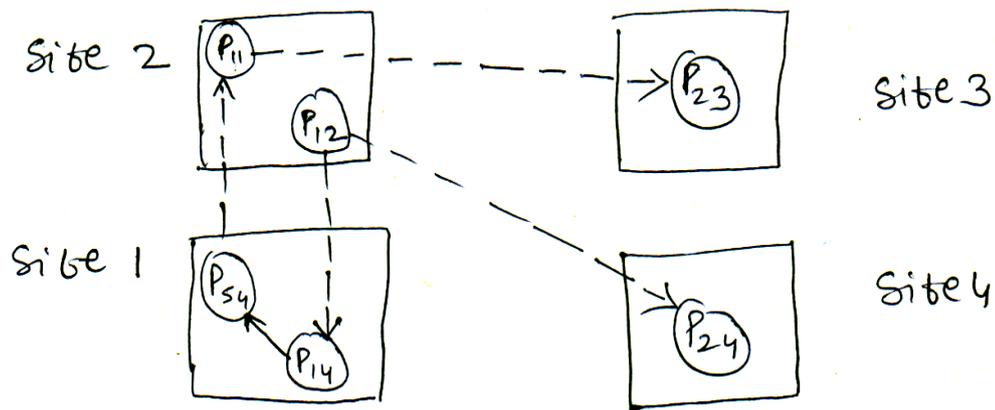
P.T.O.

**Q5)** Answer following questions.

- a) Consider the following relation  
 company (company-no, company-address, city, company-name, turnover)  
 Following is the set of simple predicates defined over company.  
 address = 'Mumbai', turnover  $\geq 3,00,000$  perform horizontal fragmentation. [4]
- b) Explain in detail threats of database security. [4]
- c) What is mean by distributed locking. [2]

**Q6)** Answer following questions.

- a) Consider the following DWFG:



Check if deadlock exists in system. If so, find out the sites involved in deadlock. [4]

- b) Briefly explain intra-query parallelism and inter-query parallelism. [4]
- c) Define the term generalization. [2]

**Q7)** Answer following questions

- a) Briefly explain data encryption methods. [5]
- b) List and explain key elements of parallel database processing. [5]

**Q8)** Answer the following questions.

- a) What are the characteristics of mobile computing. **[5]**
- b) Solve following case **[5]**

M/s ABC's internet book shop has mostly corporate customers who call the book store and give the ISBN number of a book and a quantity. M/s ABC then prepares a shipment that contains the books they have ordered in case enough copies are not available in the stock additional copies are ordered by M/s ABC. Give requirement definition and analysis.



Total No. of Questions : 8]

SEAT No. :

P2549

[Total No. of Pages : 4

[5234]-301

M.C.A. (Under Science Faculty) (Semester - III)

Computer Science

CA - 301 : DESIGN AND ANALYSIS OF ALGORITHM

(2013 Pattern)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

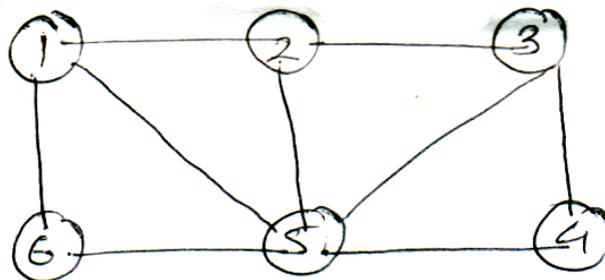
- 1) Neat diagrams must be drawn wherever necessary.
- 2) Solve any 5 (five) from following.

Q1) Attempt all of the following :

- a) Determine the polynomial of smallest degree that interpolate the point (1,2), (2,3) & (3,4) [4]
- b) Solve the given 011 knapsack instance by LCBB method by drawing variable type size space tree.  
 $M = 15, p = (10, 12, 10, 18) W = (2, 5, 4, 9)$  [4]
- c) What are the types of asymptotic notations. [2]

Q2) Attempt all of the following :

- a) Find all possible Hamiltonian cycles for following graph. [4]



- b) Find out the solution for sum of subset using fixed tuple size state space tree.  
 $M = 10, n = 4, W = (5, 7, 5, 3)$  [4]
- c) Define best case worst case and average case. [2]

P.T.O.

**Q3)** Attempt all of the following :

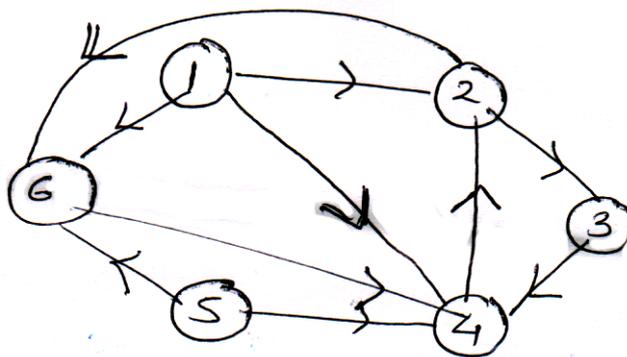
- a) State and explain Horner's rule. [4]
- b) Solve the TSP for the graph G given by adjacency matrix A using branch and bound (LCBB) [4]

$$A = \begin{bmatrix} \infty & 20 & 30 & 10 \\ 15 & \infty & 16 & 4 \\ 3 & 5 & \infty & 2 \\ 19 & 6 & 18 & \infty \end{bmatrix}$$

- c) Find  $n_0$  such that for all  $n > n_0$  the following is true. [2]  
 $3\log_2 n < 4n < n^2$

**Q4)** Attempt all of the following :

- a) Find the strongly connected components of given graph G (start vertex - 1)[4]



- b) Explain the 8 queens problems with its explicit and implicit constraints.[4]
- c) Write the control abstraction of divide & conquer. [2]

**Q5)** Attempt all of the following

- a) Apply Floyd Warshall algorithm to find lengths of shortest path from Vertex U to vertex V where adjacency matrix of G is . [4]

$$A = \begin{bmatrix} 0 & 7 & 7 & 11 \\ 6 & 0 & 6 & \infty \\ \infty & 8 & 0 & 5 \\ 19 & 9 & 8 & 0 \end{bmatrix}$$

- b) Discuss the time complexity of strassen's matrix multiplication ( i.e  $T(n) = O(n^{2.81})$ ) [4]
- c) Find the optimal merge pattern for merging the file of size 28,32, 12, 5, 84, 53, 91, 35, 3 and 11. [2]

**Q6)** Attempt all of the following :

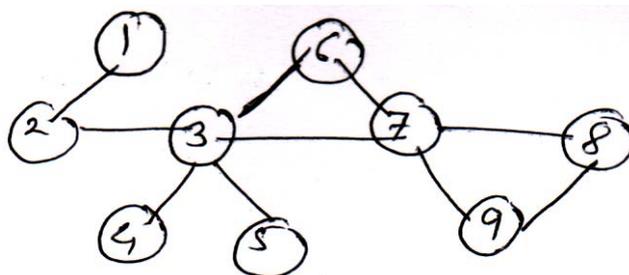
- a) Find optimal solution to the knapsack instant using greedy method  $n = 6$  and  $m = 25$   
 $p = (16, 17, 8, 3, 3, 9, 8)$ ,  $W = (16, 4, 4, 5, 8, 3, 3)$  [4]
- b) Find an optimal paranthesization of a matrix-chain product whose sequence of dimensions is  $20 \times 5$ ,  $5 \times 10$ ,  $10 \times 15$ ,  $15 \times 3$  and  $3 \times 7$  using dynamic programming method. [4]
- c) Define NP-hard and NP-complete. [2]

**Q7)** Attempt all of the following :

- a) Solve TSP for the graph G given by the adjacency matrix A using dynamic programming. [5]

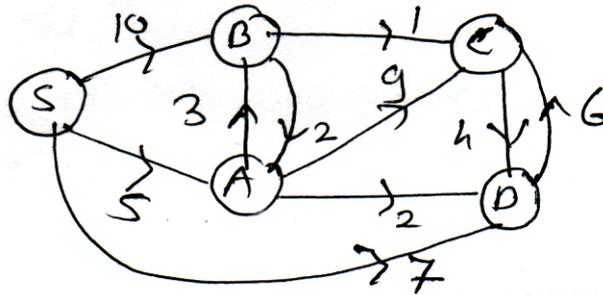
$$A = \begin{bmatrix} 0 & 10 & 15 & 20 \\ 5 & 0 & 9 & 10 \\ 6 & 13 & 0 & 12 \\ 8 & 8 & 9 & 0 \end{bmatrix}$$

- b) Find the articulation point for the following graph G. [5]

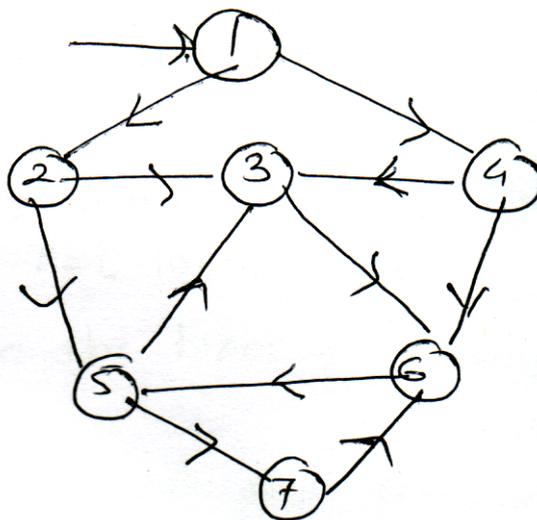


Q8) Attempt all of the following

- a) Apply the dijkstra's algorithm on the directed graph given below where S is the source [5]



- b) Draw DFS and BFS for graph G. [5]



Total No. of Questions : 8]

SEAT No. :

**P2550**

[Total No. of Pages : 3

**[5234]-302**

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

**CA - 302 : OPERATING SYSTEM CONCEPTS**

**(2013 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer the any five questions.*
- 2) *Figures to the right indicates full marks.*

**Q1)** Answer the following :

- a) Explain in short any four system calls [4]
- b) Explain basic operations on files [4]
- c) Define dispatcher [2]

**Q2)** Answer the following :

- a) Write a short note on file system mounting [4]
- b) Explain deadlock prevention strategies. [4]
- c) What is buffering. [2]

**Q3)** Answer the following :

- a) What are the different services provided by kernel related to I/O. [4]
- b) Write a short note on round robin algorithm [4]
- c) What is semaphore. [2]

**Q4)** Answer the following :

- a) Explain the free space management methods. [4]
- b) Explain dining phylosopher problem. [4]
- c) What is context switch. [2]

**P.T.O.**

**Q5)** Answer the following :

- a) State & explain the condition to be satisfied by a solution to the critical section problem. [4]
- b) Explain different file access method. [4]
- c) Define time quantum. [2]

**Q6)** Answer the following :

- a) Explain PCB [4]
- b) State & explain internal & external fragmentation with example. [4]
- c) What is thread cancellation. [2]

**Q7)** Answer the following :

- a) Consider the following processes with length of CPU burst time & arrival time in milisecond. [5]

Process	Burst time	Arrival time	Priority
P1	8	0	4
P2	6	1	6
P3	7	3	3
P4	9	3	1 (highest)

What is the average waiting time & average turn around time for the processes with

- i) Non-pre-emptive SJF &
  - ii) Priority pre-emptive scheduling
- b) Consider the following snapshot of the system answer the following questions using bankers algorithm [5]

What is the content of need matrix.

Is the system in a safe state?

Process	Allocation	MAX					Available							
		A	B	C	D		A	B	C	D				
P0	P0	0	0	1	2	P0	0	0	1	2	1	4	2	0
P1	P1	1	1	0	0	P1	1	7	5	0				
P2	P2	1	3	5	4	P2	2	3	5	6				
P3	P3	0	6	3	2	P3	0	6	5	2				
P4	P4	1	0	1	4	P4	0	6	5	6				

**Q8)** Answer the following

- a) Let head of moving disk with 200 tracks humbered from 0-199 is currenty at 100 consider the queue of requeste as follows: [5]

23, 89, 132, 42, 187

Compute the total head movements using

SSTF & SCAN algorithm

- b) Consider the following reference string [5]

1,2,3,4,1,2,5,1,2,3,4,5,

How many page faults occurs for the following algorithms

FIFO & LRU

No-of Frames = 3



Total No. of Questions : 8]

SEAT No. :

**P2551**

[Total No. of Pages : 2

**[5234]-303**

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

**CA - 303 : SOFTWARE ENGINEERING**

**(2013 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five of the following.*
- 2) *Neat diagrams must be drawn whenever necessary.*
- 3) *Figures to the right side indicate full marks.*

**Q1)** Attempt the following :

- a) Explain Mc call's quality factors. [4]
- b) Explain types of software maintenance. [4]
- c) What is request approval? [2]

**Q2)** Attempt the following :

- a) Explain spiral model in brief [4]
- b) Explain qualities of good design [4]
- c) List the types of decision tables. [2]

**Q3)** Attempt the following :

- a) Explain role of system analyst. [4]
- b) Which are the processes of project risk management? Explain any one in detail. [4]
- c) What is a module? [2]

**Q4)** Attempt the following :

- a) Write a note on software project planning [4]
- b) Explain white box testing. [4]
- c) Define Re-Engineering [2]

**P.T.O.**

**Q5)** Attempt the following :

- a) Explain Fan-in and Fan-out [4]
- b) Describe software measurement in brief. [4]
- c) What is operational feasibility study. [2]

**Q6)** Attempt the following :

- a) Explain in detail any one fact finding technique. [4]
- b) Why project control is important? Explain objectives of project control.[4]
- c) What is indicators in software measurement. [2]

**Q7)** Attempt the following :

- a) Differentiate between verification and validation. [5]
- b) Draw structure chart for "Issue item" module of inventory control system.[5]

**Q8)** Attempt the following :

- a) What is decision table? Explain steps in building decision table. [5]
- b) "Sanjivan Hospital" is one of the famous hospital in the city which gives services to the patients. hospital employ various doctors, nurse & other staff members some doctors are also working as a visiting doctors. patients are categorized as inpatient & outpatient. Inpatient get admitted in hospital in ward like general, semi-special and special as per choice. inpatients get daily treatment by doctor, which is recorded during patient also get various services offered by hospital. When patient get discharge bill is prepared as per charges; Given by doctor service utilized after paying the bill; patient get discharge. [5]

Consider above case, do the following

- i) Identify all entities & draw a context level diagram
- ii) Draw first level dataflow diagram.



Total No. of Questions : 8]

SEAT No. :

**P2552**

[Total No. of Pages : 2

**[5234]-304**

**M.C.A. - II (Science Faculty)**

**CA - 304 : JAVA**

**(2013 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five of the following.*
- 2) *Neat diagrams must be drawn wherever necessary.*

**Q1)** Attempt all of the following :

- a) Write a program to accept number of elements and display it in reverse order. [4]
- b) Explain final variable, final method and final class with an example. [4]
- c) Explain Java virtual machine. [2]

**Q2)** Attempt all of the following :

- a) What is string? write any 4 string function with one or two line example and explain it. [4]
- b) Explain architecture of swing. [4]
- c) What is stream? list out the stream functions [2]

**Q3)** Attempt all of the following :

- a) Write a program to accept two strings. and display concatenation of strings. [4]
- b) Explain life cycle of thread. [4]
- c) What is thread primitives & explain with an example. [2]

**Q4)** Attempt all of the following :

- a) What is event handling? Explain various key events in Java. [4]
- b) Which are the utility classes and explain it in short. [4]
- c) What is anonymous Inner class [2]

**P.T.O.**

**Q5)** Attempt all of the following :

- a) Explain Garbage collection. [4]
- b) Write a program to draw rectangle and triangle [4]
- c) Diagrammatic view of architecture of swing. [2]

**Q6)** Attempt all of the following :

- a) Write a Java program to copy the content of one file into another file.[4]
- b) Write a program to display today's date. [4]
- c) What is use of break and continue. [2]

**Q7)** Attempt all of the following :

- a) Write a Java program to find addition of all elements of an array and check for array limit (Use exception handling) [5]
- b) Write a applet program to accept name and display it in alphabeticaly.[5]

**Q8)** Attempt all of the following :

- a) Explain layout manager in applet. [5]
- b) Explain extending interface with one example. [5]



Total No. of Questions : 8]

SEAT No. :

P2553

[Total No. of Pages : 3

[5234]-305

M.C.A. (Under Science Faculty)

CA - 307 : NUMERICAL METHODS

(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempt any five questions of the following:
- 2) Use of single-memory, non-programmable scientific calculator is allowed.
- 3) Figures to the right indicate full marks.

- Q1)** a) If the number 0.813 is correct to last decimal, find relative error in  $(0.813)^3$ . [4]  
b) If  $f(x) = e^{ax}$ , then find  $\Delta^n f(x)$ . [4]  
c) Applying Lagrange's interpolation formula, find the quadratic polynomial which approximates the following data. [2]

$x$	1	3	4
$y(x)$	-1	7	14

- Q2)** a) Use Regula-Falsi method to obtain cube root of 18. Perform 4 iterations. [4]  
b) Use Newton's forward difference formula to compute  $\tan 14$ , from the following data. [4]

$x$	10	15	20	25	30
$\tan x$	0.1763	0.2679	0.3639	0.4663	0.5773

- c) Explain Euler's method for obtaining solution of ordinary differential equation. [2]
- Q3)** a) Derive Simpson's  $\left(\frac{3}{8}\right)^{th}$  rule for numerical integration. [4]  
b) Use Newton-Raphson method to estimate root of the equation  $e^x \cos x = 1.4$ . Take  $x_0 = 0$ . Perform 4 iterations. [4]  
c) Explain, in brief, the three methods to interpolate the given data. [2]

P.T.O.

- Q4) a)** Using Newton's divided difference formula, find a polynomial satisfying the following data. [4]

$x$	0	0.5	1.0	1.5	2.0
$f(x)$	1	0.625	1	2.875	7

- b) Consider the differential equation. [4]

$$\frac{dy}{dx} - \sqrt{xy} = 2, \quad y(1) = 1.$$

Use fourth-order Runge Kutta method to find value of  $y$  at  $x = 0.1$ .

- c) Explain geometric interpretation of Regula-Falsi method. [2]

- Q5) a)** Using Newton's backward difference formula, find the value of  $f(1.65)$  from the following data. [4]

$x$	1	1.25	1.5	1.75
$f(x)$	0.3679	0.2865	0.2231	0.1738

- b) Consider the differential equation [4]

$$\frac{dy}{dx} = x^2 + y, \quad y(0) = 0.94$$

Use Euler's modified method to compute value of  $y$  at  $x = 0.1$  correct upto 4 decimal places.

- c) With usual notation, prove that  $E \nabla \equiv \Delta$  [2]

- Q6) a)** Prove that [4]

$$f(4) = f(3) + \Delta f(2) + \Delta^2 f(1) + \Delta^3 f(1)$$

- b) Give that  $\log_{10} 654 = 2.8156$ ,  $\log_{10} 658 = 2.8182$ ,  $\log_{10} 659 = 2.8189$  and  $\log_{10} 661 = 2.8202$ . Use Lagrange's interpolation formula to estimate  $\log_{10} 656$ . [4]

- c) Use Trapezoidal rule to estimate [2]

$$I = \int_0^{0.5} f(x) dx$$

from the following data.

$x$	0	0.1	0.2	0.3	0.4	0.5
$f(x)$	2.94	2.96	3.06	3.24	3.5	3.84

- Q7) a)** Find the missing terms from the following data. **[5]**

$x$	2.0	2.1	2.2	2.3	2.4	2.5	2.6
$f(x)$	0.135	?	0.111	0.1	?	0.082	0.074

- b) Given that  $f(6) = 1.5556$ ,  $f(7) = 1.690$ ,  $f(9) = 1.908$  and  $f(12) = 2.158$ . Find  $f(8)$  using Newton's divided difference formula. **[5]**

- Q8) a)** Use Gauss forward difference formula to compute  $f(1.45)$ , from the following data. **[5]**

$x$	1	1.2	1.4	1.6	1.8	2
$f(x)$	0	-0.112	-0.016	0.336	0.992	2

- b) Use Simpson's  $\left(\frac{1}{3}\right)^{\text{rd}}$  rule to evaluate **[5]**

$$I = \int_0^1 \frac{dx}{1+x}$$

by dividing the interval into 8 equal parts. Hence find approximate value of  $\log_e^2$ .



Total No. of Questions : 8]

SEAT No. :

**P2554**

[Total No. of Pages : 2

**[5234]-306**

**M.C.A. (Under Science)**

**CA - 308 : MULTIMEDIA SYSTEMS**

**(2013 Pattern) (Semester - III)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Solve any five questions.*
- 2) *Figures to the right indicate full marks.*

**Q1)** Answer the following :

- a) Explain the basic synchronization issues. [4]
- b) In relation to MHEG explain: object hierarchy, non-editability, macro-facility. [4]
- c) Define multimedia. [2]

**Q2)** Answer the following :

- a) Explain the basic steps in image processing. [4]
- b) Explain the uses of audio in computer applications. [4]
- c) What are hybrid systems. [2]

**Q3)** Answer the following :

- a) Explain the concepts of sampling and quantization. [4]
- b) Explain image formats in brief [4]
- c) What is hytime [2]

**Q4)** Answer the following :

- a) Explain lossy and lossless compression [4]
- b) Explain with example audio and video capture with synchronized play. [4]
- c) What are digitised documents. [2]

**P.T.O.**

**Q5)** Answer the following :

- a) Explain differential pulse coded modulation in detail. [4]
- b) Explain how data is compressed using huffman encoding scheme. [4]
- c) What is multimedia synchronization. [2]

**Q6)** Answer the following :

- a) Explain quicktime movie file format [4]
- b) Explain temporal instants and temporal intervals. [4]
- c) What is closed logical data unit. [2]

**Q7)** Answer the following :

- a) Explain the multimedia conferencing architecture [5]
- b) Explain embedded domain system design [5]

**Q8)** Answer the following :

- a) Explain the measurements used to compare various interchange formats. [5]
- b) Explain the issues that should be considered while designing a presentation. [5]



Total No. of Questions : 8]

SEAT No. :

P2555

[Total No. of Pages : 2

[5234]-307

M.C.A. (Science Faculty)

COMPUTER SCIENCE

CA - 309 : DOT NET

(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answer any five questions.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

- Q1)** a) Explain ASP.NET page life cycle with the help of diagram. [4]  
b) Write a note on System.Object class in C#. [4]  
c) What is Inheritance? Explain with example. [2]
- Q2)** a) Explain disconnected Architecture of ADO.NET with the help of diagram. [4]  
b) What is CLR? Explain CLR components. [4]  
c) What is garbage collection. [2]
- Q3)** a) List and explain access modifiers in C#. [4]  
b) Describe the late binding with reflection. [4]  
c) List & explain ADO.NET components. [2]
- Q4)** a) What is delegate? Explain in brief. [4]  
b) What is synchronization? Explain synchronization Issues? [4]  
c) Attempt the following [2]  
i) What is CTS?  
ii) List 2 exception classes derived from System.SystemException.

P.T.O.

- Q5)** a) What is private and shared assemblies. [4]  
b) What is web server control. [4]  
c) Attempt the following [2]  
i) Explain implicit conversion  
ii) What is unicast delegate
- Q6)** a) Write a note on validation control. [4]  
b) Explain 4 collections with examples. [4]  
c) Attempt the following [2]  
i) What is IIS?  
ii) Explain any 2 most common properties of the control class.
- Q7)** a) Write a program in C# to throw and handle following exceptions in banking applications. [5]  
Minimum Balance Exception: When balance is less than 1000/-  
Daily Deposit Exception : In a day only 50,000/- can be deposited.  
Display details of each exception. Use required member and methods?  
b) What is state management in ASP.NET? Explain two major categories in details. [5]
- Q8)** a) Write a program in C# to change the background color of form and change font of text on the form as user select appropriate dialog box.(Use proper dialog box.) [5]  
b) Write a program in C# (windows/console) which will read text files from mentioned file system location. Also list subdirectories from mentioned folder on the file system using System.IO name space and the available classes. [5]



Total No. of Questions : 8]

SEAT No. :

**P2556**

[Total No. of Pages : 2

**[5234]-401**

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

**CA - 401 : COMPUTER GRAPHICS**

**(2013 Pattern) (Credit System) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

**Q1)** Attempt the following :

- a) Explain display file and give its structure. [4]
- b) Explain the types of reflections in 3D transformation. [4]
- c) Define [2]
  - i) 4 - neighbourhood of a pixel
  - ii) 8 - neighbourhood of a pixel

**Q2)** Attempt the following :

- a) Rotate a triangle defined by A(0,0), B(6,0) and C(3,3) by  $90^\circ$  about origin in anticlockwise direction. ( $\cos 90 = 0$   $\sin 90 = 1$ ) [4]
- b) Give the advantages and disadvantages of z-buffer algorithm. [4]
- c) What is a wireframe model. [2]

**Q3)** Attempt the following :

- a) What is mid-point subdivision algorithm Give its advantages over when sutherland clipping algorithm [4]
- b) Write a note one : Keyboard & mouse [4]
- c) Define [2]
  - i) Acceleration
  - ii) Refresh rate

**P.T.O.**

**Q4)** Attempt the following :

- a) Explain sutherland hodgman algorithm. [4]
- b) Write a short note on RGB color model [4]
- c) What is spatial coherence [2]

**Q5)** Attempt the following :

- a) Explain mid point circle algorithm. [4]
- b) Write a short note on lookup table and state its use [4]
- c) Explain the term [2]
  - i) Horizontal retrace
  - ii) Vertical retrace

**Q6)** Attempt the following :

- a) Explain the CMYK model [4]
- b) Discuss merits and demerits of DDA algorithm. [4]
- c) Explain the term [2]
  - i) windowing
  - ii) clipping

**Q7)** Attempt the following :

- a) What are curves give the parametric curve description. [5]
- b) State the properties of B-spline curves. [5]

**Q8)** Attempt the following :

- a) Explain simple seed fill algorithm. [5]
- b) explain 3-dimensional viewing. [5]



Total No. of Questions : 8]

SEAT No. :

**P2557**

[Total No. of Pages : 2

**[5234]-402**

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

**CA - 402 : SDK**

**(2013 Pattern) (Semester - IV) (Credit System)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any 5 questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

**Q1)** Answer the following :

- a) What are client Area and non-client Area messages? [4]
- b) What is MDI? Explain MDI functions. [4]
- c) Enlist any four Menu related Functions. [2]

**Q2)** Answer the following :

- a) Why to use message Box( )? What is the role of window procedure?[4]
- b) What are the different types of header files used in windows? [4]
- c) Comment "Timer messages are not asynchronous" True or false justify.[2]

**Q3)** Answer the following :

- a) Write a note on 'Modeless Dialog Box' [4]
- b) Write in detail steps to get data from clipboard [4]
- c) What is the use of FrameRect( )? [2]

**Q4)** Answer the following :

- a) Define Hungarian Notation. Give the parameters pass to CreateWindow(). [4]
- b) Write a short note on Message Loop. [4]
- c) "Each character in Unicode is 8 bits wide rather than 16 bits" Justify True or False. [2]

**P.T.O.**

**Q5)** Answer the following :

- a) Explain Critical Section. Give details about related functions in Thread Synchronisation. [4]
- b) What is the use of Setpixel ( ) & Getpixel ( )? Give the functions to draw lines. [4]
- c) Define Socket( )? What does it contain? [2]

**Q6)** Answer the following :

- a) Give examples of keyboard Accelerator? Why to use them. [4]
- b) Write a note on Dialog Box. procedure. [4]
- c) Define Dynamic Linking. [2]

**Q7)** Answer the following :

- a) Write a SDK program to display one scroll bar in the left half of the client area labeled "Red". As you scroll the scroll bar, right half of the changes to composite color indicated by "red" color. [5]
- b) Explain any two ODBC APIs. [5]

**Q8)** Write a SDK program to display caret at top left position in client Area, use function keys ( $f_1, f_2, f_3, f_4$ ) to move caret left, right, up, down on position. [10]



Total No. of Questions : 8]

SEAT No. :

P2558

[Total No. of Pages : 2

[5234]-403

M.C.A. (Science Faculty)

CA - 403 : Advance Java

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Neat diagrams must be drawn wherever necessary.
- 2) Figures to the right indicate full marks.
- 3) Solve any five(5) form the following.

**Q1)** Attempt all of the following :

- a) Explain the different types of JDBC drivers. [4]
- b) Explain TreeSet with an example. [4]
- c) State directives in JSP, Explain any one [2]

**Q2)** Attempt all of the following :

- a) What is InetAddress class? Explain any two methods of InetAddress class. [4]
- b) What is cookie? Explain how a cookie can be created and accessed in a servlet. [4]
- c) What is Bean? Why use Java Beans? [2]

**Q3)** Attempt all of the following :

- a) What is metadata? Explain the interface ResultSetMetaData and DatabaseMetaData with an example. [4]
- b) What is a socket? Give Java methods that allow a client to open a socket connection and create an InputStream object for receiving response from server. [4]
- c) Write any two differences between ArrayList and LinkedList. [2]

P.T.O.

**Q4)** Attempt all of the following :

- a) What is vector? Define the working of class vector. How it is different from an array. [4]
- b) What is URL? Explain URL class methods with suitable example. [4]
- c) Difference between doGet ( ) and doPost ( ) methods. [2]

**Q5)** Attempt all of the following :

- a) What are the resultset type [4]
- b) What are the different ways of session Handling in servlet programming? Explain any one [4]
- c) What is JSP? Write the syntax of comment in JSP. [2]

**Q6)** Attempt all of the following :

- a) Explain handling data from HTML to servlet with suitable example. [4]
- b) Explain JSP life cycle. [4]
- c) What is session bean? State types of session bean. [2]

**Q7)** Attempt all of the following :

- a) Write a JDBC application to take the student information (like studid, name, birth, date) from the user and insert into student table and display all student information which is inserted when clicked on show button.[5]
- b) Write a Java servlet program that reads two numbers and return their sum. [5]

**Q8)** Attempt all of the following :

- a) Write a JSP program to display all even numbers from 10 to 50 using tags. [5]
- b) Write a JSP application to accept user name and password from HTML and display 'welcome' statement if username and password is equal other wise display 'Invalid user' Statement. [5]



Total No. of Questions : 8]

SEAT No. :

**P2559**

[Total No. of Pages : 3

**[5234]-404**

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

**CA - 404 : OBJECT ORIENTED SOFTWARE ENGINEERING  
(2013 Pattern) (Credit System) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) Attempt five of the following.*
- 2) Neat diagrams must be drawn wherever necessary.*
- 3) Figures to the right indicate full marks.*

**Q1)** Attempt the following :

- a) Draw state chart diagram for an "account" object [4]
- b) Explain various elements of usecase diagram [4]
- c) Define artifacts [2]

**Q2)** Attempt the following :

- a) Explain various testing strategies. [4]
- b) What are advantages of iterative development [4]
- c) Explain stereotypes [2]

**Q3)** Attempt the following :

- a) Write short note on disciplines of unified process. [4]
- b) Draw usecase diagram for "online examination system" [4]
- c) Explain advantages of modeling. [2]

**P.T.O.**

**Q4)** Attempt the following :

- a) Write a short note on object oriented analysis [4]
- b) Explain following relationships in UML [4]
  - i) Dependency
  - ii) Association
  - iii) Aggregation
  - iv) Composition
- c) Define [2]
  - i) Component
  - ii) Package

**Q5)** Attempt the following :

- a) Explain architecture of UML in detail. [4]
- b) Explain interclass test case designing [4]
- c) Explain swim lane with example [2]

**Q6)** Attempt the following :

- a) Explain Booch method in detail. [4]
- b) Draw activity diagram for retail store. [4]
- c) Explain Fork & Join [2]

**Q7)** Attempt the following :

- a) A Customer can book a ticket anytime before a flight takes off. If the ticket is booked 60 days in advance then the customer is eligible for a discount booked tickets can be cancelled 2 hours before the flight takes off. Cancelled tickets are liable for penalty upto 90% of the priced ticket. Regular customers do not attract penalty for cancelled tickets. Money should be refunded to the customers within 15 days of the cancellation. The system should generate alert when only 10 tickets are pending to be sold for a particular flight. The customers can opt for a pick-up from a pre-defined address before the flight. Regular customers are provided the service free of charge if opted for. consider above situation, draw the following UML diagram. [5]
  - i) Class diagram
  - ii) Sequence diagram
- b) Draw communication diagram for ATM system [5]

**Q8)** Attempt the following :

- a) Consider social networking site. Different users connect to each other through a connect request user can upload photos, music, videos & textual data on their account. It can be made visible to connected users. Other users can like, dislike or comment on the posts of other users. Users can share others post on their account. Draw following diagrams[5]
- i) Class diagram
  - ii) Activity diagram
- b) Write short note on object modeling technique [5]



Total No. of Questions : 8]

SEAT No. :

**P2560**

[Total No. of Pages : 2

**[5234]-405**

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

**CA - 407 : CYBER LAW**

**(2013 Pattern) (Credit System) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *Neat diagrams must be drawn wherever necessary.*

**Q1)** Attempt the following :

- a) Explain legal recognition of electronic signature. [4]
- b) Explain the nature and scope of cyber law [4]
- c) Explain the term : Renewal of licence. [2]

**Q2)** Attempt the following :

- a) Discuss the legal issues discussed in Griffise case. [4]
- b) What is the process of application to issue a licence? [4]
- c) What is computer resource. [2]

**Q3)** Attempt the following :

- a) Write short note on appointment of controller authority. [4]
- b) State & explain various types of trademarks [4]
- c) What do you mean by copyright & patent. [2]

**P.T.O.**

**Q4)** Attempt the following :

- a) Define electronic record. Explain legal recognition of electronic record[4]
- b) Write short note on infringing copy. [4]
- c) What do you mean by cyber space. [2]

**Q5)** Attempt the following :

- a) Write a short note on Domain Name Dispute. [4]
- b) Explain the term framing in detail. [4]
- c) Define : key pair [2]

**Q6)** Attempt the following :

- a) What are the uses of electronic records. [4]
- b) Discuss : Punishment for violation of privacy [4]
- c) Define : [2]
  - i) Cyber cafe
  - ii) Cyber security

**Q7)** Attempt the following :

- a) Explain the Amendments to Indian Evidence Act 1872, in view of Information Technology Act 2000. [5]
- b) Write short note on Adjudication. [5]

**Q8)** Attempt the following :

- a) Discuss the importance of Information Technology act 2000, in era of cyber space. [5]
- b) What is the procedure for suspension of licence. [5]



Total No. of Questions : 8]

SEAT No. :

P2561

[Total No. of Pages : 3

[5234]-406

M.C.A. (Under Science Faculty)

CA - 408 : SOFT COMPUTING

(2013 Pattern) (Credit System) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempt any five questions.
- 2) Neat diagrams must be drawn whenever necessary.
- 3) Figures to the right indicate full marks.
- 4) Assume suitable data, if necessary.

Q1) Attempt the following :

- a) Define artificial neural network explain the architecture of neural network. [4]
- b) Consider two fuzzy sets  $\underline{A}$  &  $\underline{B}$  [4]

$$\underline{A} = \left\{ \frac{1}{2} + \frac{0.5}{3} + \frac{0.3}{4} + \frac{0.2}{5} \right\}$$

$$\underline{B} = \left\{ \frac{0.5}{2} + \frac{0.7}{3} + \frac{0.2}{4} + \frac{0.4}{5} \right\}$$

For the above fuzzy sets find

- i)  $A|B, B|A$
- ii) Apply Demorgan's law on Fuzzy set
- c) What is fuzzy relation? [2]

Q2) Attempt the following :

- a) Define aggregation of Fuzzy rules. [4]
- b) Given the following Fuzzy numbers & using Zadeh's extension principle calculate.  
 $K = I.J$   
and explain why  $\mu$  is nonconvex. [4]
- c) State the condition under which the  $\mu$ -LMS algorithm is said to be convergent. [2]

P.T.O.

**Q3)** Attempt the following :

- a) Explain how genetic algorithm works? [4]
- b) Write a short note on pattern space and weight space. [4]
- c) What is intensification. [2]

**Q4)** Attempt the following :

- a) Explain advantages of Neural network [4]
- b) Explain Fuzzy inference process. [4]
- c) What is overfitting? [2]

**Q5)** Attempt the following :

- a) State defuzzification methods. Explain any two in detail. [4]
- b) The membership functions for linguistic variables "tall" and "short" are given below [4]

$$\text{"tall"} = \left\{ \frac{0.2}{5} + \frac{0.3}{7} + \frac{0.7}{9} + \frac{0.9}{11} + \frac{1.0}{12} \right\}$$

$$\text{"short"} = \left\{ \frac{0.3}{0} + \frac{0}{30} + \frac{1}{60} + \frac{0.5}{90} + \frac{0}{120} \right\}$$

Develop membership function for following linguistic phrases:

- i) Very tall
- ii) Fairly tall
- iii) Not very short
- c) What is dilation [2]

**Q6)** Attempt the following :

- a) For Fuzzy relation  $R$  [4]

$$R = \begin{bmatrix} 1 & 0.1 & 0 & 0.5 & 0.3 \\ 0.02 & 0.1 & 0.55 & 1 & 0.6 \\ 0.2 & 1 & 0.6 & 1 & 0 \\ 0.03 & 0.5 & 1 & 0.3 & 0 \end{bmatrix}$$

Find  $\lambda$ -cut relation for  $\lambda = 0^+, 0.1, 0.4, 0.8$

$$R_\lambda = \begin{Bmatrix} 1 \\ 0 \end{Bmatrix}$$

- b) Describe any two neuron signal function with suitable diagram. [4]
- c) Define any two logical connectives for fuzzy logic. [2]

**Q7)** Attempt the following :

- a) Explain limitations of genetic algorithm [5]
- b) Compare : Brain (Biological Neuron) Vs computer (Artificial Neuron)[5]

**Q8)** Attempt the following :

- a) Explain components of artificial neuron in brief. [5]
- b) What is fuzzy inference system? Explain advantages and disadvantages of it. [5]



Total No. of Questions : 8]

SEAT No. :

**P2562**

[Total No. of Pages : 2

**[5234]-407**

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

**CA - 409 : ARTIFICIAL INTELLIGENCE**

**(2013 Pattern) (Credit System) (Semester - IV)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

**Q1) a) What is AI? Explain different AI techniques: [4]**

b) The following is a problem which can be solved using state space search techniques. [4]

"A monkey is in a cage and bananas are suspended from the ceiling the monkey wants to eat a banana but cannot reach them. In the room are a chair and a stick. If the monkey stands on the chair and waves the stick he can knock a banana down to eat it" formalize the above problem in terms of state space you should.

- i) Suggest a suitable representation for the problem.
- ii) State what the initial and final / goal states are in this representation.
- iii) What are the action the monkey should take? List the action as operators/rules for getting from one state to the next giving any condition on when they may be applied.

c) What is production system. [2]

**Q2) a) Explain the algorithm for steepest hill climbing. [4]**

b) Describe A\* search and give the proof of optimality of A\* [4]

c) What is the use heuristic function. [2]

**P.T.O.**

- Q3)** a) Write notes on Explanation Based Learning? (EBL) [4]  
 b) Explain the constraint satisfaction procedure to solve cryptarithmic problem. [4]  
 c) What is mean end analysis? [2]
- Q4)** a) Explain minimax search procedure [4]  
 b) Explain with an example learning in decision tree [4]  
 c) Define role learning [2]
- Q5)** a) Convert the following statements to first order logic (FOL) [4]  
 i) All pompeian were Romans  
 ii) All romans were either loyal to caesar or hated him  
 iii) Everyone loyal to someone  
 iv) Marcus tried to assassinate caesar  
 b) Explain the forward chaining and backward chaining. [4]  
 c) What is unification algorithm. [2]
- Q6)** a) Construct semantic net representation. [4]  
 i) Pompeian (marcus), Blacksmith (marcus)  
 ii) Mary gave the green flowered vase to her favorite cousin  
 b) Write the complete procedure or steps to convert wff's into clauseform. [4]  
 c) Define planning [2]
- Q7)** a) Construct a script for going to the movie from the viewpoint of movie goer. [5]  
 b) Write a PROLOG program of print 7<sup>th</sup> fibonacci number using recursion. [5]
- Q8)** a) Show the conceptual dependency representation of the sentence. [5]  
 i) John took the book from mary  
 ii) John ate icecream with a spoon  
 b) What is PROLOG? Explain the different types of variables. [5]



Total No. of Questions : 8]

SEAT No. :

**P2563**

[Total No. of Pages : 2

**[5234]-501**

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

**CA - 501 : INTERNET PROGRAMMING**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *Assume suitable data if necessary.*

**Q1)** Attempt the following.

- a) Explain any four iterative functions in PHP. [4]
- b) Write note on Pear DB. [4]
- c) Write a note on server socket layer (SSL) [2]

**Q2)** Attempt the following.

- a) Explain Client- Server model in PHP. [4]
- b) Compare GET and POST methods of PHP. [4]
- c) Explain with example explode() and implode() [2]

**Q3)** Attempt the following.

- a) Write note on setting response headers. [4]
- b) Write a example to create a XML file in PHP. [4]
- c) DB: is Error(\$database) is used to show errors in database query Justify true/false [2]

**Q4)** Attempt the following.

- a) Explain any four super global variable in PHP. [4]
- b) Write disadvantage of IMAP protocol. [4]
- c) Write anonymous function for addition of 2 numbers in php. [2]

**P.T.O.**

**Q5)** Attempt the following.

- a) Explain inheritance with example in PHP. [4]
- b) Define an array find the elements from the array that matches the given value using appropriate search function. [4]
- c) Differentiate between XML and HTML? [2]

**Q6)** Attempt the following.

- a) Explain functions fread( ), fwrite ( ), fgetc ( ), fgets( ) [4]
- b) HTTP is stateless protocol explain, write methods to main state. [4]
- c) Explain the purpose of array \_filter function. [2]

**Q7)** Attempt the following.

- a) write php script to validate E-mail id with regular expression [5]
- b) write a short note on scaling images [5]

**Q8)** Attempt the following.

- a) Explain file uploads in PHP in detail [5]
- b) Consider the following relation [5]

Dept (Dno, Dname)

Emp (Eno, Ename, Eadd)

Dept —Emp is one to many relationship

Write a PHP program to accept Dept. name and print Emp details work in that Dept.



Total No. of Questions : 8]

SEAT No. :

**P2564**

[Total No. of Pages : 2

**[5234]-502**

**M.C.A. -III (Under Science Faculty)**

**CA - 502 : PRINCIPLES OF PROGRAMMING LANGUAGES**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *Draw neat diagrams wherever necessary.*
- 3) *Figures to the right indicate full marks.*

**Q1)** Answer the following :

- a) Explain the concept of late binding in detail. [4]
- b) Explain the structure of prolog program. [4]
- c) Explain CDADR with example. [2]

**Q2)** Answer the following :

- a) What is internal & external fragmentation. [4]
- b) Describe four common parameter passing modes? How does a programmer chooses which one to use when? [4]
- c) Define the terms [2]
  - i) Facts
  - ii) Rules

**Q3)** Answer the following :

- a) Write short note on Iteration [4]
- b) Explain the data types in LISP with example [4]
- c) What is dangling reference? [2]

**P.T.O.**

**Q4)** Answer the following :

- a) What is replicated inheritance. [4]
- b) Write short note on calling sequence. [4]
- c) What is type clash. [2]

**Q5)** Answer the following :

- a) What is a dope vector? What purpose does it serves? [4]
- b) Explain the purpose & structure of compilers symbol table. [4]
- c) Define recursion. Give one example. [2]

**Q6)** Answer the following :

- a) Why ordering within an expression is important. [4]
- b) What is unification? State rules of unification. [4]
- c) Define [2]
  - i) Prologue
  - ii) Epilogue

**Q7)** Answer the following :

- a) Discuss advantages and disadvantages of interoperability of pointers and arrays in 'C'. [5]
- b) Write a PROLOG program to print List of odd & even elements of the given list. [5]

**Q8)** Answer the following :

- a) Explain difference between type conversion, type coercion & non converting type cast. [5]
- b) Explain in detail and with example, why it is useful to define exceptions as classes in C++ & Java. [5]



Total No. of Questions : 8]

SEAT No. :

**P2565**

[Total No. of Pages : 2

**[5234]-503**

**M.C.A. - III (Science Faculty)**

**CA - 503 : DATA MINING AND WAREHOUSING**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

**Q1)** Attempt all the following:

- a) Discuss the major issues in data mining? [4]
- b) Explain data cleaning as process in data mining [4]
- c) Define 'gini index'. [2]

**Q2)** Attempt all the following:

- a) What is WEKA? What are advantages of WEKA? [4]
- b) Explain types of association rule. [4]
- c) Discuss need for data preprocessing? [2]

**Q3)** Attempt all the following:

- a) What are the challenges in web mining? [4]
- b) What is the different way of handling noisy data? [4]
- c) What is Bayesian classifier? [2]

**Q4)** Attempt all the following:

- a) Explain dimensional data modeling [4]
- b) Write a note on Data warehouse Architecture. [4]
- c) Define liner regression. [2]

**P.T.O.**

**Q5)** Attempt all the following:

- a) Write short note on Market basket analysis [4]
- b) What are the two approaches to avoid over fitting? [4]
- c) What do you mean by active learning? [2]

**Q6)** Attempt all the following:

- a) Explain accuracy and error measures for classifiers. [4]
- b) Explain decision tree induction. [4]
- c) Define snowflake schema [2]

**Q7)** Attempt all the following:

- a) Explain Fp- growth algorithm with its advantages. [5]
- b) Explain baseline algorithms zeroR. [5]

**Q8)** Attempt all the following:

- a) Explain Hierarchical clustering. [5]
- b) Find frequent item set by Apriori method [5]  
Given minimum support count is 2.

TID	List of Item
1	a, b,c
2	b,d
3	b,e
4	a,b,d
5	a,e
6	b,e
7	a,e
8	a,b,e,c
9	a,b,e



Total No. of Questions : 8]

SEAT No. :

**P2566**

[Total No. of Pages : 2

**[5234]-504**

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

**CA - 504 : SOFTWARE PROJECT MANAGEMENT**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five out of eight questions.*
- 2) *Figures to the right indicate full marks.*
- 3) *All questions carry equal marks.*

**Q1)** Answer the following :

- a) Explain the role of project manager. [4]
- b) What are the contents of project management plan. [4]
- c) Define OBS [2]

**Q2)** Answer the following :

- a) Define & explain [4]
  - i) Scope management plan
  - ii) Project scope statement
- b) Write short note on quality control [4]
- c) Define the term "Project". Give an example of IT projects. [2]

**Q3)** Answer the following :

- a) Summarize the processes involved in project cost management. [4]
- b) Define & explain [4]
  - i) Status report
  - ii) Progress report
- c) Define the term "Deliverables" [2]

**P.T.O.**

**Q4)** Answer the following :

- a) Write short note on project organizational chart. [4]
- b) What are different types of cost estimates explain any one in detail [4]
- c) Define [2]
  - i) Scope statement
  - ii) Scope creep

**Q5)** Answer the following :

- a) What are different tools & Techniques used for risk identification. [4]
- b) What do you mean by "Contract". State various types and explain any one in detail. [4]
- c) Define : WBS dictionary. [2]

**Q6)** Answer the following :

- a) Summarize the processes involved in human resource management. [4]
- b) Explain the 3-sphere model for system development. [4]
- c) State the purpose of [2]
  - i) Project charter
  - ii) Project management plan

**Q7)** Answer the following :

- a) Write short note on deming & his fourteen points for quality management.[5]
- b) What is project scope management. What are different activities involved in it. [5]

**Q8)** Answer the following :

- a) Write short note on [5]
  - i) AOA/ADM method
  - ii) PDM method
- b) What is schedule development? What are tools & techniques used in schedule development [5]



Total No. of Questions : 8]

SEAT No. :

**P2567**

[Total No. of Pages : 2

**[5234]-505**

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

**CA - 507 : IMAGE PROCESSING**

**(2013 Pattern) (Semester - V)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Answer any five questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate the full marks.*
- 4) *All questions carry equal marks.*
- 5) *Assume suitable data, if necessary.*

- Q1)** a) Define Digital Image Processing. Discuss uses of Digital Image Processing. [4]  
b) Discuss Histogram Equalization Technique. [4]  
c) Describe Region Filling. [2]
- Q2)** a) Define 8-Adjacency. Explain 8- adjacency with Example. [4]  
b) Explain Filters in Frequency Domain. [4]  
c) Write short note on Thinning. [2]
- Q3)** a) Compare how First and Second —order Derivatives are useful in Image Processing. [4]  
b) Write short note on Image Enhancement techniques. [4]  
i) Arithmetic  
ii) Logic Operations  
c) What do you mean by m-adjacency? [2]
- Q4)** a) What is 2-D discrete Fourier Transform and Convolution Theorem. [4]  
b) Explain Gaussian Low pass Filters. [4]  
c) Describe Reflection. [2]

*P.T.O.*

- Q5)** a) Discuss the Noise models in Image Degradation and Restoration. [4]  
b) Write note on Thresholding. [4]  
c) Explain Shape Methods. [2]
- Q6)** a) Differentiate Spatial domain Low-Pass and High-Pass Filters. [4]  
b) Write short note on Chain Code with example. [4]  
c) Name any two Morphological Algorithms. [2]
- Q7)** a) Explain Open and Close operation work with the help of Diagram. [5]  
b) Write short note on: Frequency domain Low pass Filters. [5]
- Q8)** a) Explain Components of a general purpose Image Processing System.[5]  
b) Write Short Note on [5]  
i) Geometric Mean  
ii) Geometric Transformation.



Total No. of Questions : 8]

SEAT No. :

P2568

[Total No. of Pages : 2

[5234]-506

M.C.A. (Science Faculty)

COMPUTER SCIENCE

CA - 508 : E-Commerce

(2013 Pattern) (Semester - V)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answer any five questions.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.

Q1) Attempt all the following:

- a) What are major advantage and disadvantages of e-commerce? [4]
- b) Describe the evolution of internet in detail? [4]
- c) What is electronic cash? [2]

Q2) Attempt all the following:

- a) Explain the strategies for web-auction. [4]
- b) Discuss the types of electronic payment system. [4]
- c) Define net banking. [2]

Q3) Attempt all the following:

- a) Explain EDI model. [4]
- b) What are the different measures to ensure security? [4]
- c) What is Domain Name? [2]

Q4) Attempt all the following:

- a) What is Router? Explain its function [4]
- b) Explain layer architecture EDI system. [4]
- c) What is an ISDN. [2]

P.T.O.

**Q5)** Attempt all the following:

- a) What is the difference between intranet and extranet? [4]
- b) Discuss the information publishing technology. [4]
- c) What is scope of e-commerce? [2]

**Q6)** Attempt all the following:

- a) What is the online shopping? Explain its advantage and disadvantages[4]
- b) Explain common service center. [4]
- c) What is Google Apps Engine.? [2]

**Q7)** Attempt all the following:

- a) Explain internet marketing techniques. [5]
- b) Explain Advance Technologies used in e-commerce. [5]

**Q8)** Attempt all the following:

- a) What is e-cycle of internet marketing. [5]
- b) What are the type's business model of e-commerce? [5]



Total No. of Questions : 8]

SEAT No. :

P2569

[Total No. of Pages : 2

[5234]-507

M.C.A. (Under Science Faculty) (Semester - V)

CA - 509 : MOBILE COMPUTING

(2013 Pattern)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Figures to right indicate full marks.*
- 2) *Neat diagram must be drawn whenever necessary.*
- 3) *Attempt any five questions.*
- 4) *All questions carry equal marks.*
- 5) *Assume suitable data, if required.*

- Q1)** a) How wireless transport layer establishes secure connection? [4]  
b) Which are the different types of handovers in GSM? [4]  
c) Give any two requirements of mobile IP. [2]
- Q2)** a) What is wireless markup language? [4]  
b) Explain the need of small cells in cellular system. [4]  
c) Define: cluster, cell breathing. [2]
- Q3)** a) What are the different components of GPRS? What is their purpose?[4]  
b) Explain the advantages and disadvantages of message oriented middleware. [4]  
c) What are hidden and exposed terminals? [2]
- Q4)** a) What is WiMAX? [4]  
b) Explain the WAP push architecture. [4]  
c) What is soft and hard handoff? [2]

P.T.O.

- Q5)** a) Discuss the working of mobile TCP. [4]  
b) What are the applications of RFID. [4]  
c) What role is played by HLR and VLR? [2]
- Q6)** a) What is client context manager? [4]  
b) Write a note on wireless telephony application. [4]  
c) Write any two advantages of I-TCP. [2]
- Q7)** a) Name the main elements of mobile IP and describe their functions. [5]  
b) What are problems associated with reverse path in mobile IP? [5]
- Q8)** a) What are constraints in design application of handheld devices? [5]  
b) What is MMS? How it is different from short message service? Describe MMS architecture. [5]



Total No. of Questions : 8]

SEAT No. :

P2570

[Total No. of Pages : 2

[5234]-601

M.C.A. (Science Faculty)

CA - 602 : SOFTWARE TESTING & QUALITY ASSURANCE

(2013 Pattern) (Semester - VI)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Answer any five questions.
- 2) Neat diagrams must be drawn wherever necessary.
- 3) Figures to the right indicate full marks.

Q1) Attempt all the following:

- a) State and explain any two software quality factors. [4]
- b) Differentiate between validation and verification. [4]
- c) Define Quality. [2]

Q2) Attempt all the following:

- a) Define defects. Explain defects management process in brief [4]
- b) Write short note on SQA activities. [4]
- c) What is quality movement? [2]

Q3) Attempt all the following:

- a) Explain scatter diagram in detail. [4]
- b) What are the steps for deriving test cases? [4]
- c) What is the use of run chart? [2]

Q4) Attempt all the following:

- a) Explain quality cost for decision making [4]
- b) Explain attributes of effective software metrics. [4]
- c) Explain software review [2]

P.T.O.

**Q5)** Attempt all the following:

- a) Explain size oriented metrics [4]
- b) Write short note on Integration testing [4]
- c) List types of black box testing. [2]

**Q6)** Attempt all the following:

- a) Explain stress testing and performance testing [4]
- b) Write short note on Apache Jmeter. [4]
- c) Explain role of user in quality assurance. [2]

**Q7)** Attempt all the following:

- a) Write short note on ISO 9001 Quality Standard. [5]
- b) Draw Cause-effect diagram for house paint peeling. [5]

**Q8)** Attempt all the following:

- a) Write short note on quality cost measurement. [5]
- b) Write short note on Statistical quality assurance. [5]



Total No. of Questions : 8]

SEAT No. :

**P2571**

[Total No. of Pages : 2

**[5234]-602**  
**M.C.A. (Science)**  
**COMPUTER**  
**CA - 603 : Embedded Systems**  
**(2013 Pattern) (Semester - VI)**

*Time : 3 Hours]*

*[Max. Marks : 50*

*Instructions to the candidates:*

- 1) *Attempt any five questions.*
- 2) *Draw neat diagrams whenever necessary.*
- 3) *Symbols have there usual meaning.*

- Q1)** a) Explain features of an embedded system. [4]  
b) Explain foreground & background system with example. [4]  
c) What is latency? [2]
- Q2)** a) Explain the block diagram of 8057 microcontroller [4]  
b) Differentiate between harvard & van-neuman architecture. [4]  
c) What is interrupt? [2]
- Q3)** a) Explain the components of embedded system. [4]  
b) Explain the different priorities present in real time systems. [4]  
c) What is assembler? [2]
- Q4)** a) Explain the timers of 8051 in details: [4]  
b) What is resources & sheared resources? Explain this using suitable example. [4]  
c) What is size of RAM & ROM of 8051 microcontroller. [2]

*P.T.O.*

- Q5)** a) Write a short note on scheduling techniques. [4]  
b) Which parameters are considered while designing target board. [4]  
c) What is debugger? [2]
- Q6)** a) Explain the types of instruction of 8051 microcontroller. [4]  
b) Write a short note on logic analyzer. [4]  
c) What is deadlock? [2]
- Q7)** a) Differentiate between RISC & CISC processors. [5]  
b) Explain compilation process in detail. [5]
- Q8)** a) Explain software designing cycle in detail. [5]  
b) Explain multiuser multitasking o.s. [5]



Total No. of Questions : 8]

SEAT No. :

P2572

[Total No. of Pages : 2

[5234]-603

M.C.A. - III (Under Science Faculty)

CA - 604 : INFORMATION SECURITY & AUDIT

(2013 Pattern) (Semester - VI)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempt any five questions out of eight.
- 2) All questions carry equal marks.
- 3) Figures to the right indicate full marks.

**Q1)** Attempt each of the following:

- a) What is information security? Explain its characteristic. [4]
- b) Write a short note on firewall. [4]
- c) Differentiate between authentication and authorization. [2]

**Q2)** Attempt each of the following:

- a) What are advantage and disadvantage of intrusion detection system. [4]
- b) What is malicious software? Explain how to prevent malicious software. [4]
- c) What is flooding attack? [2]

**Q3)** Attempt each of the following:

- a) Explain the various database security issues. [4]
- b) Explain ethical and legal issues in information security. [4]
- c) Define threats. [2]

**Q4)** Attempt each of the following:

- a) Explain the password based authentication system. [4]
- b) What are the different types of attack? Explain any one. [4]
- c) Define virus and its types. [2]

P.T.O.

**Q5)** Attempt each of the following:

- a) Explain the role based access control. [4]
- b) What is public key encryption? How it works? [4]
- c) What denial of service attack? [2]

**Q6)** Attempt each of the following:

- a) Write a note on digital signature. [4]
- b) Write a note on biometric authentication. [4]
- c) Define intellectual property. [2]

**Q7)** Attempt each of the following:

- a) What are the different steps for operating system hardening? [5]
- b) What is meaning of cybercrime? Give some example of cybercrime. [5]

**Q8)** Attempt each of the following:

- a) Explain various software security issues. [5]
- b) Explain general computer crime laws. [5]



Total No. of Questions : 8]

SEAT No. :

P2573

[Total No. of Pages : 2

[5234]-604

M.C.A. - III (Under Science Faculty)

CA - 605 : CLOUD COMPUTING

(2013 Pattern) (Semester - VI)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) Attempt any five questions out of eight.
- 2) All questions carry equal marks.
- 3) Figures to the right indicate full marks.

**Q1)** Attempt each of the following:

- a) Explain the cloud service provider? List any two cloud service providers. [4]
- b) What is sky computing? [4]
- c) List any two components of cloud computing. [2]

**Q2)** Attempt each of the following:

- a) Explain service virtualization in brief. [4]
- b) Explain cloud security fundamentals. [4]
- c) Define QoS(Quality of Service). [2]

**Q3)** Attempt each of the following:

- a) Explain Load Balancing. [4]
- b) Explain cloud file systems: GFS and HDFS. [4]
- c) List any two benefits of cloud economics. [2]

**Q4)** Attempt each of the following:

- a) Write a short note on parallel computing. [4]
- b) Explain Automatic security in cloud computing. [4]
- c) Define resource optimization. [2]

P.T.O.

**Q5)** Attempt each of the following:

- a) Explain mobile cloud computing. [4]
- b) Discuss about strength & weaknesses of the cloud computing. [4]
- c) Define virtual community. [2]

**Q6)** Attempt each of the following:

- a) What is virtual application? Explain any two in brief. [4]
- b) List cloud computing platforms. Explain any two in brief [4]
- c) Define SaaS(Software as a Service). [2]

**Q7)** Attempt each of the following:

- a) Define virtualization technologies and its architecture. [5]
- b) Explain Vulnerabilities assessment tool for cloud. [5]

**Q8)** Attempt each of the following:

- a) Explain hybrid cloud development model. [5]
- b) Explain briefly “monitoring in cloud”. [5]

