[5334] - 101

M.C.A.

(Under Science Faculty - I)

CA - 101 : Programming with 'C'

(2013 Pattern) (Semester - I)

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 any four string manipulation functions in details.   **[4]**

    b)   Explain functions used to allocate and deallocate memory dynamically.**[4]**

    c)   "C is middle level language", Comment.   **[2]**

Q2) Attempt the following:

    a)   Explain pointer with different operations.   **[4]**

    b)   Write a 'C' program to print following pattern.   **[4]**

```
      *
    *   *
  * *   * *
```

c) What will be output of the following:- **[2]**

```
main ( )

{

  printf( );

}

 main ( )

{

  const int i = 10 ; i = 20 ;

}
```

Q3) Attempt each of the following:

a) Explain while loop with example. **[4]**

b) Write a 'C' program to accept a decimal number and convert it to equivalent binary number using user defined function. **[4]**

c) Explain any two modes of file. **[2]**

Q4) Attempt the following:

a) What is function? Explain in detail types of function calling? **[4]**

b) Write a 'C' program using structure to accept name, author, rate, no. of books from user and display author name and total cost in sorted order of rate. **[4]**

c) Explain one dimensional array with example. **[2]**

Q5) Attempt the following:

a) What do you mean by formal and actual parameter? Explain with an example. **[4]**

b) Write down syntax for following functions used in graphics. **[4]**

 i) ellipse

 ii) rectangle

 iii) arc

c) What is seek() function? **[2]**

Q6) Attempt the following:

a) Explain call by value and call by reference used in function with suitable example. **[4]**

b) Write a 'C' program to find transpose of matrix. **[4]**

c) Write output of the following program. **[2]**

main ( )

{

    char *a = "abc";

    printf ("%c", *aH);

    printf("%c\\", *a);

}

Q7) Attempt the following:

   a)   Write an algorithm and draw a flowchart to check given number is prime
        number.   **[5]**

   b)   Write a 'C' program for addition of two matrices.   **[5]**

Q8) Attempt the following:

   a)   Explain structure in detail? What are difference between structure and
        union?   **[5]**

   b)   Write a 'C' program using function to accept string and find out
        occurences of each vowels in it.   **[5]**

[5334] - 102

M.C.A. - I (Science)

COMPUTER SCIENCE

CA-102: Database Management System

(2013 Pattern) (Semester - I)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

   1) *Attempt any five questions*

   2) *Figures to the right indicates full marks.*

   3) *Assume appropriate data, if necessary.*

Q1) Attempt each of the following:

   a)   Explain DBMS architecture with diagram.   **[4]**

   b)   Explain the responsibilities of a DBA.   **[4]**

   c)   Define primary key, foreign key.   **[2]**

Q2) Attempt each of the following:

   a)   With the following FD's compute (BCD)$^+$.   **[4]**

        A->BC, CD->E, E->C, D-> AEH, ABH->BD, DH->BC.

   b)   What is serializability? Explain conflict serializability.   **[4]**

   c)   State the properties of Transaction.   **[2]**

Q3) Attempt each of the following:

    a)   Consider the following transaction, find out two schedules serializable to serial schedule <T1, T2, T3>: **[4]**

T1	T2	T3
Read(X)	Read(Z)	Read(Y)
X=X+100	Read(Y)	Read(Z)
Write(X)	Y=Y+Z	Y=Y+50
Read(Y)	Write(Y)	Write(Y)
Y=Y-100	Read(X)	Z=Z+Y
Write(Y)	X=N-Z	Write(Y)
Write(X)		

    b)   What is canonical cover? State the procedure to compute it. **[4]**

    c)   Define Weak Entity, 2NF. **[2]**

Q4) Attempt each of the following:

    a)   Discuss set membership and range specifier operators in sQL. **[4]**

    b)   What are the benefits of strict two phase locking? What are the disadvantages. **[4]**

    c)   When the relation is said to be in 3NF. **[2]**

Q5) Attempt each of the following:

    a)   Explain the concept of Multiple Granularity Locking. **[4]**

    b)   Discuss pattern matching operators in SQL. **[4]**

    c)   Define BCNF. **[2]**

Q6) Attempt each of the following:

a) Explain difference operation and Cartesian product operation with suitable example. **[4]**

b) Explain recoverable schedule and cascadless schedule with example.**[4]**

c) What is lock? Explain types of locks. **[2]**

Q7) Attempt each of the following:

a) What is RAID? Explain different levels of RAID. **[5]**

b) Explain ACID properties of transaction in detail. **[5]**

Q8) Attempt each of the following:

a) Atharva Yoga Exercise center having two receptionists who take care that every person who comes in center giving the fess or not? There are many Gents, Ladies and children who come to do exercise. The center provides, Gem, aerobic, swimming, tennis, chess and yoga. Each section has different well trained coach. **[5]**

There is management committee to manage all the outside things like marketing, taxes etc.

Draw E-R Diagram for the information system design.

b) The log corresponding to a particular schedule for three transactions T1, T2, T3 is as follows: **[5]**

[Start, T1]

[Start, T2]

[Read, T1, A]

[Write, T2, B, 25, 50]

[Start, T3]

[Commite, T2]

[5334]-102   **3**

[Start, T4]

[Write, T1, C, 100, 115]

[Commite, T1]

[Write, T3, D, 50, 60]

[Read, T3, E]

[Write, T4, D, 60, 75]

[Commit, T_4]

[Write, T3, D, 25] System crash

If immediate update with checkpoint is used, what will be the recovery procedure?

$\mathcal{E}\mathcal{E}\mathcal{E}$

[5334]-103

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

CA - 103 : MATHEMATICAL FOUNDATIONS
(2013 Pattern) (Semester-I)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

1) *Solve any five questions out of eight questions.*

2) *Figures to the right indicate full marks.*

3) *Use of non-programmable scientific. Calculator is allowed.*

Q1) Attempt each of the following :

   a)   Let A and B be two sets. Show that $(A \cup B)^c = A^c \cap B^c$.   **[4]**

   b)   Let $A = \{1, 2, 3, 4\}$, $B=\{a, b, c\}$. Does there exist a onto function from Set A to Set B. Justify.   **[4]**

   c)   Give an example of a symmetric relation which is not a reflexive relation.   **[2]**

Q2) Attempt each of the following :

   a)   Let f: $\mathbb{R} \to \mathbb{R}$, $f(x) = x - 12$ and g: $\mathbb{R} \to \mathbb{R}$, $g(x) = 4x$. Find $(f \ o \ g)^{-1}(x)$ and $(g \ o \ f)(x)$.   **[4]**

   b)   Let $A = \{x \in R \ / \ x^2 + 5x + 6 = 0\}$ and $B = \{x \in R \ / \ (x+1)(x+2) = 0\}$. Find $A \times B$.   **[4]**

   c)   Define partial order also give an example of a partial order on set of Integer $\mathbb{Z}$.   **[2]**

Q3) Attempt each of the following :

   a)   Let P(x) be the statement "Student x knows algebra" and let Q(y) be the statement "Class y contains a student who knows algebra". Express each of the following as quantifications of P(x) and Q(y).   **[4]**

i)   All students know algebra.

ii)   Not every student knows algebra.

b)   Show that $\forall x(P(x) \wedge Q(x))$ and $\forall xP(x) \wedge \forall xQ(x)$ are logically equivalent. **[4]**

c)   Find a compound proposition involving propositions p, q and r that is false when p and q and r is true, but true otherwise. **[2]**

Q4) Attempt each of the following :

a)   Give a proof by contradiction of theorem If n is an integer and 7n+4 is odd then n is odd. **[4]**

b)   Show that $\forall x(P(x) \vee Q(x))$ and $\forall xP(x) \vee \forall xQ(x)$ are not logically equivalent. **[4]**

c)   Let $Q(x, y)$ be the statement $x + y = xy$. If the universe of discourse for both variables consists of all integers, what are the truth values, $Q(3,3)$ and $Q(2,2)$? **[2]**

Q5) Attempt each of the following :

a)   Find G.C.D. of Polynomials $f(x) = x^2 + 7x + 6$ and $g(x) = x^2 - 5x - 6$. **[4]**

b)   Find all roots of $x^3 - 12x^2 - 39x + 28 = 0$. Where roots are in arithmetic progression. **[4]**

c)   Use Remainder theorem to find remainder when $x^5 + 3x^3 - 7x^2 + 4$ divided by $x - 2$. **[2]**

Q6) Attempt each of the following :

a)   Describe all solutions of $3x \equiv 2 \ (mod \ 5)$. **[4]**

b)   Prove that if $x \equiv y \ (mod \ n)$ and $m \ / \ n$, then $x \equiv y \ (mod \ m)$. **[4]**

c)   Find remainder of 4^{10} when divided 7. **[2]**

Q7) Attempt each of the following :

a) Let $\sigma = \begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 5 & 3 & 2 & 1 & 7 & 6 & 8 & 9 \end{pmatrix}$ **[5]**

            i)   Write σ as a product of disjoint cycles.

            ii)   Write σ as a product of transpositions.

            iii)   Determine whether σ is even or odd

            iv)   Find order of σ.

            v)   Find inverse of σ.

b) Find g.c.d. of 2772 and 2310 and express it in linear combinations of 2772 and 2310. **[5]**

Q8) Attempt each of the following :

a) Solve the following system of equations by Guass elimination method. **[5]**

$$x - 3x + 4z = 0$$
$$2x + 5y - z = 0$$
$$3x + y - 2z = 0$$

b) Find inverse of matrix $A = \begin{bmatrix} 1 & 2 & -1 \\ 4 & -2 & 3 \\ -2 & -1 & 0 \end{bmatrix}$ by adjoint method. (if exist)

                                                                                                            [5]

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[5334]-104

M.C.A. (Science Faculty)

CA - 104 : CONCRETE MATHEMATICS AND GRAPH THEORY

(2013 Pattern) (Semester - I)

*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 indicates full marks.

    4)   Use of single memory, non-programmable scientific calculator is allowed.
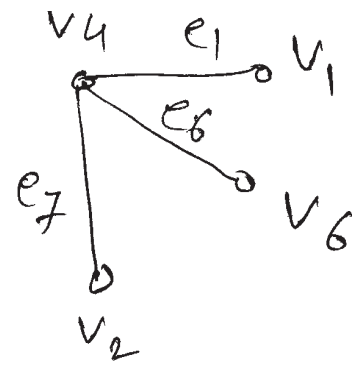
Q1) Attempt each of the following:

    a)   Express the natural number 354 in binary and ternary base representations.

                    [4]

    b)   For the graph G_1, G_2, G_3 given below, find $G_1 \oplus (G_2 \cap G_3)$ **[4]**
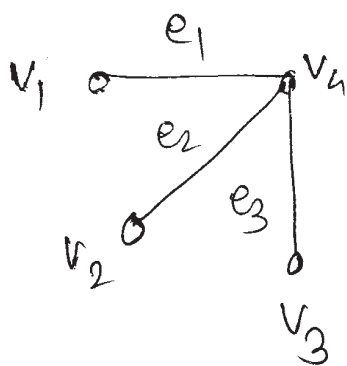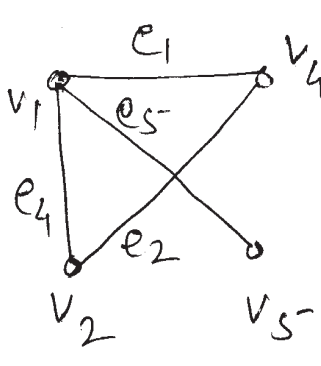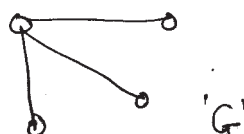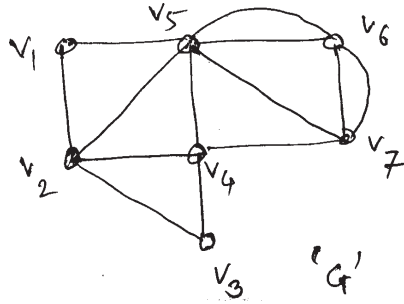

    c)   Find the complement of graph G below.   **[2]**

Q2) Attempt each of the following:

a) Use Fleury's algorithm, to find Euler tour in the following connected graph. **[4]**

b) Draw the following graph from adjacency matrix and find complement of its underlying graph. **[4]**

$$\begin{bmatrix} 2 & 1 & 0 & 1 \\ 1 & 0 & 1 & 1 \\ 0 & 1 & 0 & 1 \\ 1 & 1 & 1 & 1 \end{bmatrix}$$

c) Fuse the vertices V_3 and V_5 of the following graph G and hence find centre of the resultant graph. **[2]**
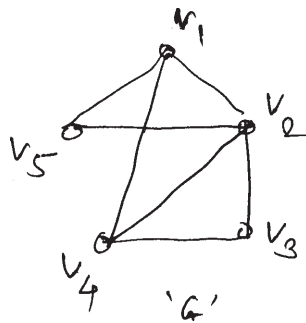
Q3) Attempt each of the following:

a) Encrypt the message "DO NOT PASS" by using linear cipher
$f(x) \equiv 3x + 7 \pmod{26}$ **[4]**

b) Using Prim's algorithm, find shortest spanning tree of following graph. **[4]**
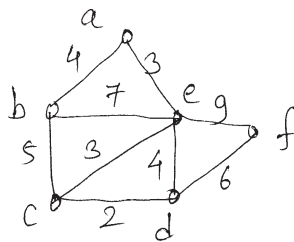
c) Prove that integers 353 and 120 are relatively prime to each other. **[2]**

Q4) Attempt each of the following:
    a)   There are precisely n distinct residue classes modulo n.   **[4]**
    b)   Solve the recurrence relation.   **[4]**

$$a_r - 5a_{r-1} + 10\,a_{r-2} = 0, \; a_0 = a_1 = 2.$$

    c)   Write definations of   **[2]**
        i)   Non-planar graph
        ii)   Digraph

Q5) Attempt each of the following:
    a)   Draw arborescence for the following expression and express it in the polish notation $\dfrac{a+b}{c \cdot d - e} + f^2$.   **[4]**

    b)   Solve the recurrence relation $a_{r+2} + 2a_{r+1} + a_r = 2^r$, $a_0 = 2, a_1 = 3$.   **[4]**
    c)   Obtain preorder and postorder traversal for the following binary tree.**[2]**
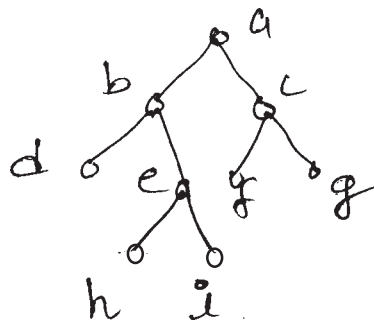
Q6) Attempt each of the following:
    a)   Prove that k_{33} and k_5 are not planar graph.   **[4]**
    b)   Solve the following travelling salesman problem for a sales person based at V in the graph.   **[4]**
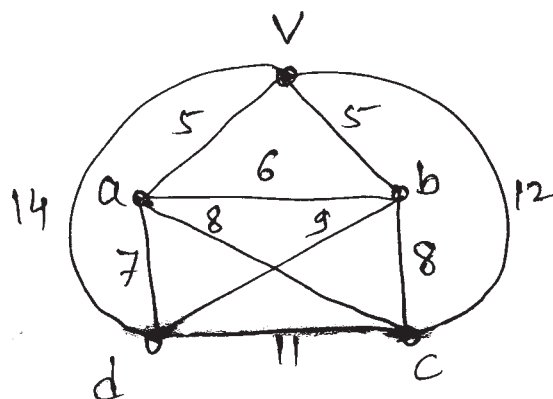
    c)   Draw the graph which is complete as well as complete bipartite graph.**[2]**

Q7) Attempt each of the following:

    a)   Find all integers x which leave a remainder of 1, 2, 3 and 4 when divided by 5, 7, 9 and 11 respectively. **[5]**

    b)   Using Dijkstra's algorithm, find the shortest path from vertex 'a' to all vertices of graph **[5]**
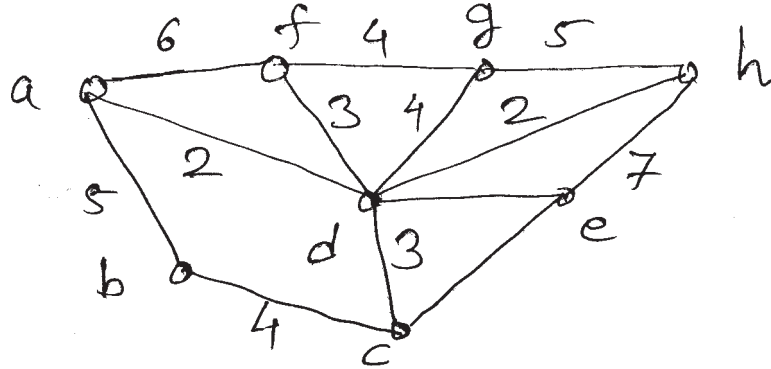
Q8) Attempt each of the following:

    a)   What is the ciphertext that is produced when RSA encryption with public key (e, n) = (3, 2669) is used to encrypt the message BEST LUCK? Use the protocol A = 00, B = 01, ..., Z = 25 and break your message up into blocks of length 4. **[5]**

    b)   Explain Maximum and Minimum Cut-Flow algorithm. **[5]**

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M.C.A. (Under Science Faculty)
CA-105 : COMPUTER ORGANIZATIONS
(2013 Pattern) (Semester-I)

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) a)   What is need of Interrupt vector Table?   **[4]**
     b)   What is concept of stack? How one can load and unload of data?   **[4]**
     c)   State the features of USB.   **[2]**

Q2) a)   What is counter? Explain 3 bit asynchronous up counter using logic diagram.   **[4]**
     b)   Explain functions of ALU in details.   **[4]**
     c)   How many address lines required for 4:1 MUX?   **[2]**

Q3) a)   What is decoder? Draw logic diagram for 3 to 8-line decoder and explain its working with truth table.   **[4]**
     b)   Explain typical microcomputer organisation. Explain functions of blocks.   **[4]**
     c)   Using NAND Gates only, implement NOT and AND gate.   **[2]**

Q4) a)   What is purpose of parallel processing? Give one example.   **[4]**
     b)   Explain De-Morgan's theorem with profile.   **[4]**
     c)   Define half adder.   **[2]**

Q5) a)   Explain function of CPU in microcomputer system.   **[4]**
     b)   Explain shift register in details.   **[4]**
     c)   Draw logic diagram of RS latch using NAND gate and give its truth table.   **[2]**

P.T.O.

Q6) a) Explain working of half adder with its logic diagram. **[4]**

    b) Explain concept of MBR and MAR in brief. **[4]**

    c) Define cache memory. **[2]**

Q7) a) Draw circuit diagram of 4-bit R-2R ladder network DAC with its working.
[5]

    b) Explain concept of Numeric co-processor. **[5]**

Q8) a) Using K-map simplifies following expression and draw simplified logic diagram.

       F (A, B, C, D) = A′BCD + ABC′D + ABCD + A′B′CD **[5]**

    b) What is need of cache? Explain direct mapping technique of cache memory with main memory. **[5]**

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[5334] - 201

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

CA-201: DATA STRUCTURES

(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.*

4) *Assume suitable data if necessary.*

Q1) Attempt all of the following:

a) Define the term circular queue? Explain its advantages with example.**[4]**

b) Evaluate following postfix expression using stack.

   75 32 ^ * 9 22 ^ − 1 + 64 * +   **[4]**

c) Define: Data structure.   **[2]**

Q2) Attempt all of the following:

a) Sort following data using Heap sort. Show all iterations.   **[4]**

   26, 5, 77, 1, 61, 11, 59, 15.

b) What are the different types of linked list? Explain in brief.   **[4]**

c) Define stack. List applications of stack.   **[2]**

Q3) Attempt all of the following:

    a)   Find preorder, postorder and inorder tree traversal for following binary tree.   **[4]**
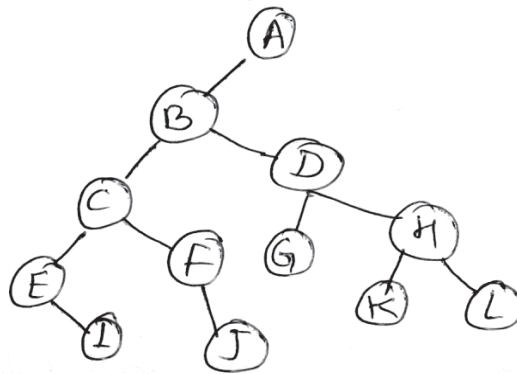
    b)   Write a 'C' function to concatenate two linked list.   **[4]**

    c)   Find adjacency list for the following graph.   **[2]**

Directd graph (a)
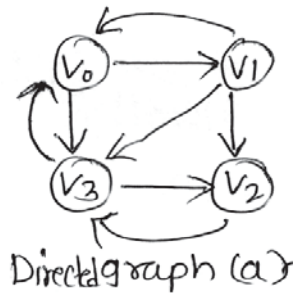
    find adjacency matrix for graph a.

Q4) Attempt all of the following:

    a)   Sort following data using quick sort.   **[4]**

        20, 54, 48, 37, 12, 92, 86, 07.

    b)   Write short note on Hashing.   **[4]**

    c)   Show that $f(x) = O(g(x))$ where   **[2]**

        $f(x) = x^2 + 5x$

        $g(x) = x^2$

[5334]-201

Q5) Attempt all of the following:

    a)   Write short note on B+ tree structure.   **[4]**

    b)   Write 'C' function for bubble sort.   **[4]**

    c)   Explain with example Big 'O' notation.   **[2]**

Q6) Attempt all of the following:

    a)   Write a 'C' function to check well formedness of paranthesis.   **[4]**

    b)   Each element of an array Data [10] [40] requires 4 Byte of storage. Base address of data = 1000. Determine the location of element data [10] [10] when array is stored as-   **[4]**

        i)   Column major

        ii)   Row major

    c)   Define: **[2]**

        i)   Complete Binary tree.

        ii)   Deque.

Q7) Attempt all of the following:

    a)   For following graph compute the shortest path from vertex 0 to all other vertices using Dijkstras algorithm   **[5]**
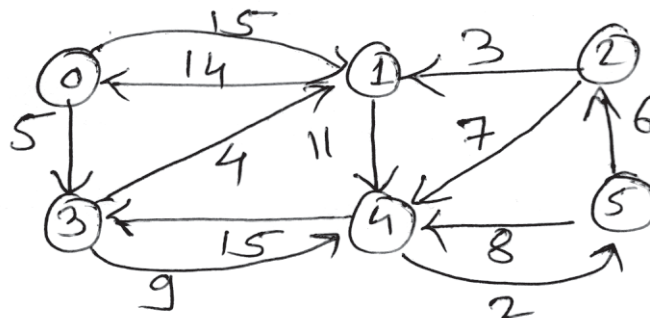
b) Construct AVL tree for following values.   [5]

    23, 34, 12, 11, 6, 2, 45, 4, 25, 24.

Q8) Attempt all of the following:

a) Write 'C' function to add two polynomials.   [5]

b) Construct BST by inserting following data sequencially.   [5]

    45, 32, 70, 67, 21, 85, 92, 40.

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M.C.A. - I (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 right indicates full marks.*
4) *All questions carry equal marks.*

Q1) Attempt the following

a)   Construct DFA to accept all strings over {p,q,r} which is having substring qrp and ending with pq.   **[4]**

b)   Construct FA from given regular expression [01 + 10]* + 0 (01*)*.   **[4]**

c)   Give the tuples of PDA.   **[2]**

Q2) Attempt the following

a)   Convert the given grammar into CNF   **[4]**

   S $\to$ ABC

   A $\to$ a/b

   B $\to$ Bb/bb

   C $\to$ aC/CC/ba

b)   Check whether L : {0^p| p is prime} is regular. Justify your answer.   **[4]**

c)   Define   **[2]**

   i)   Proper prefix

   ii) Proper sufix

Q3) Attempt the following:

   a) Construct PDA for L : $\{0^n 1^m 2^{n+m} \mid n, m \geq 1\}$ **[4]**

   b) Construct CFG for L : $\{a^n b^{n+1} \mid n \geq 1\}$ **[4]**

   c) List any two types of Turing machine.   **[2]**

Q4) Attempt the following:

   a) Construct DFA equivalent to gien NFA   **[4]**
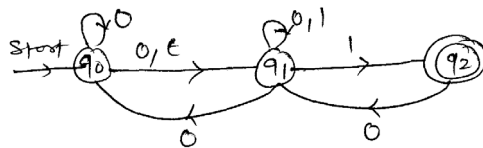
   b) Minimize the given DFA   **[4]**
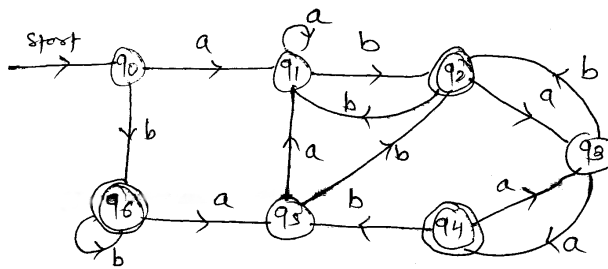
   c) State any two properties of regular sets.   **[2]**

Q5) Attempt the following:

   a) Construct Mealy machine to convert each occurance of substring 101 by 100 over alphabet $\{0,1\}$ **[4]**

   b) Construct Turing machine accepting following language

       L : $\{0^i 12^{it2} \mid i \geq 0\}$ **[4]**

   c) Construct regular expression for L : {p, q, r} which acceptrs all strings having substring qqr. **[2]**

Q6) Attempt the following:

 a) Construct moore machine to print complement of binary number. **[4]**

 b) Convert the following grammar into GNF **[4]**

  S → AB

  A → BS/b

  B → SA/a

 c) Give the tuples of moore & Mealy machine. **[2]**

Q7) Attempt the following

 a) Construct Turing Machine which can find out additon of two given binary numbers. **[5]**

 b) Construct PDA for given CFG **[5]**

  S → AB

  A → aAb|ab

  B → cBd|cd

Q8) Attempt the following

 a) Write a note on properties of context free languages. **[5]**

 b) Convert given NFA with E moves to NFA without E moves. **[5]**
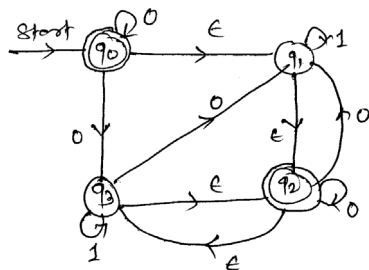
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[5334] - 203

MCA - I (Science Faculty)

CA-203 : OBJECT ORIENTED PROGRAMMING

(C++ Programming)

(2013 Pattern) (Semester - II)

Time : 3 Hours]   *[Max. Marks :50*

Instructions to candidates:

    a)   *Answer any five questions from the following.*

    b)   *Figures to the right indicate full marks.*

Q1) Attempt all of the following: **[4+4+2=10]**

    a)   What is destructor? Explain with example.

    b)   Explain the terms : a) Polymorphism

                         b) inheritance

    c)   What is putto operator?

Q2) Attempt all of the following: **[4+4+2=10]**

    a)   What are stream classes? Explain any two in detail.

    b)   What is inline function. Give its limitation.

    c)   What are different types of operations in C++.

Q3) Attempt all of the following: **[4+4+2=10]**

    a)   How to rethrow an exception? Explain with example.

    b)   Write a program in C++ to accept an email address & throw an exception if it does not contain @ sign.

    c)   Give difference between virtual & pure virtual function.

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

    a)   Write a C++ program for class book (title, author, price). Accept data of n books and display them.

    b)   What are limitations of operator over loading.

    c)   What do you mean by a reference variable?

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

    a)   Explain class template with multiple parameter. Give suitable example.

    b)   State and explain use of scope resolution operator.

    c)   When the catch (......) handler is used?

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

    a)   Write short note on manipulators.

    b)   Trace the output & explain it

```
class A
{ public : A( )
          {cout < < "\n obj created";}
          ~ A ( )
          {cout < < "\n obj destroyed";}
};
A al;
main ( )
{ A a2 ;
    {A a3 ; }
    exit (0);
}
```

c) Trace & Explain the output for following.

```
# include < iostream.h>
Class Base
{ Public:
virtual void fun ( )
    { cout < < "Fun of Base" > >}
    void run ( )
    { fun ( ) ;}
    };
Class Derived : Public Base
    { Public:
    void fun ( )
    { cout < < "Fun of Derived";}
    };
void main ( )
{ Derived d;
d. run ( );
}
```

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

a) State & explain features & advantages of generic function.

b) Write a program in C++ to find area of circle using object oriented programing such that the calss circle must have three inline Functions namely:

   a) read ( ) to accept the radius from user.
   b) compute ( ) for calculating area.
   c) Display ( ) for displaying the result

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

a) Write short note on allocator.

b) Write a C++ program with employee (e no, e name) and project (p no, p name) and derive class emp - proj (duration - in -days). Define accept ( ) and display ( ) function in each class. Also store information of 'n' emp - proj objects & display it.

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[5334] - 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 necessory.*

Q1) Attempt all of the following:

    a)   Write short note on polling?   **[4]**

    b)   What is Ethernet? Explain switched Ethernet?   **[4]**

    c)   Find out class, Netid, Hostid for IP address - 156, 26, 30, 32.   **[2]**

Q2) Attempt all of the following:

    a)   Define protocol? What are key elements of protocol.   **[4]**

    b)   Differentiate between TCP/IP and OSI Model.   **[4]**

    c)   Define   **[2]**

        i)   Bit rate,

        ii)   Bit length.

Q3) Attempt all of the following:

    a)   Write short note on ALOHA?   **[4]**

    b)   Write short note on transmission modes?   **[4]**

    c)   What is name space and explain its types?   **[2]**

P.T.O.

Q4) Attempt all of the following:

   a)   What are uses of UDP?   **[4]**

   b)   Compare virtual circuit & datagram.   **[4]**

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

Q5) Attempt all of the following:

   a)   What is network topology? Explain any one with advantages and disadvantages.   **[4]**

   b)   Construct CRC code message for given polynomial $x^7 + x^5 + x^4 + x^2 + x^1 + x^0$ and generator polynomial $x^5 + x^4 + x^1 + x^0$.   **[4]**

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

Q6) Attempt all of the following:

   a)   Explain fast Ethernet with it's goals.   **[4]**

   b)   Compare Adaptive and Non-Adaptive Routing algorithm.   **[4]**

   c)   Define the terms.   **[2]**

       i)   Defactor

       ii)   Dejure

Q7) Attempt all of the following:

   a)   Differentiate circuit switching and packet switching.   **[5]**

   b)   What is Routing? Give properties of routing algorithm.   **[5]**

Q8) Attempt all of the following:

   a)   What are different fields of TCP - Header? Explain it with neat diagram.**[5]**

   b)   Explain different agents in E-mail.   **[5]**

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[5334]-205

M.C.A. - I (Sciecne Faculty)
CA - 205 : ADVANCED DATABASE MANAGEMENT SYSTEM
(2013 Pattern) (Semester - II)

Time : 3 Hours]　　　　　　　　　　　　　　　　　　　　　*[Max. Marks : 50*
Instructions to the candidates:
　　1)　Answer any five questions.
　　2)　All questions carries equal marks.

Q1) Attempt all of the following:

　　a)　Explain data allocation in details.　　　　　　　　　　**[4]**

　　b)　Explain spatial database model.　　　　　　　　　　　**[4]**

　　c)　What is mean by classes.　　　　　　　　　　　　　　**[2]**

Q2) Attempt all of the following:

　　a)　Explain multimedia database with example.　　　　　　**[4]**

　　b)　Differentiate between ORDBMS and OODBMS.　　　　**[4]**

　　c)　What is data encryption.　　　　　　　　　　　　　　**[2]**

Q3) Attempt all of the following:

　　a)　What are characteristics of object oriented Database.　　**[4]**

　　b)　State advantages & disadvantages of parallel database.　**[4]**

　　c)　State the meaning of granting and revoking privileges.　**[2]**

Q4) Attempt all of the following:

　　a)　Explain different types of Distributed Database.　　　　**[4]**

　　b)　Explain the terms : MAC and statistical database security.　**[4]**

　　c)　What is inheritance.　　　　　　　　　　　　　　　　**[2]**

Q5) Attempt all of the following:

    a)   Consider the following relation. Company (Company - no, company - address, city company - name, tumover)
Following is the set of simple predicate defined over company address = "Pune", tumover ≥ 2,50,000? Perform Horizontal fragmentation. **[4]**

    b)   What is distributed locking? **[4]**

    c)   Define time stamping. **[2]**

Q6) Attempt all of the following:

    a)   Consider the following DWFG. **[4]**
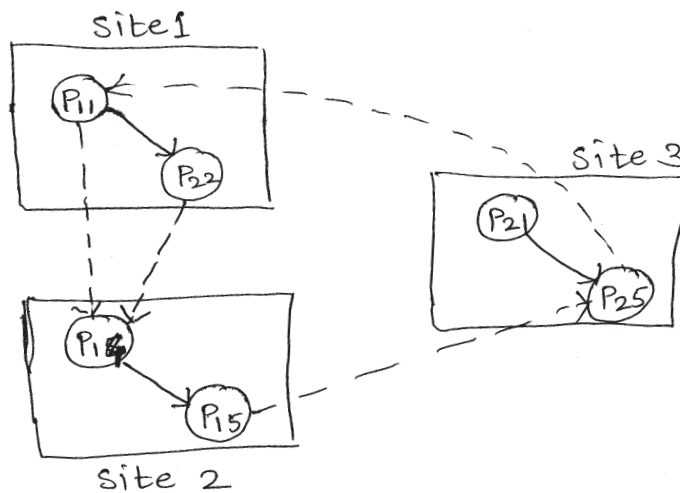
        Check if deadlock exists in system. If so find out the sites & processes involved in deadlock.

    b)   What is intra operation parallelism and interoperation parallelism. **[4]**

    c)   Define assembly structure. **[2]**

Q7) Attempt all of the following:

    a)   Briefly explain ORDBMS design. **[5]**

    b)   What are desired properties of distributed database. **[5]**

Q8) Attempt all of the following:

    a)   Write note on architecture of shared memory multiple CPU paralled database. **[5]**

    b)   Explain in detail 2-phase commit protocol in distributed database. **[5]**

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[5334]-301

M.CA-II (Under Science Faculty)
COMPUTER SCIENCE
CA-301 : Design and Analysis of Algorithm
(2013 Pattern) (Semester-III)

Time : 3 Hours]   *[Max. Marks : 50*
Instructions to the candidates:
   1) *Neat diagram 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 (0, 5), (1, 10) (2, 21). **[4]**
   b) Solve the given instance of TSP by using Branch and bound reduced cost matrix method. **[4]**

$$\begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix}$$

   c) If F(n) and g(n) are non negative functions then $f(n) + g(n) = \theta$ min (f (n), g (n)). State true or False? Justify. **[2]**

Q2) Attempt all of the following :
   a) Explain the various techniques for representing graph with example. **[4]**
   b) Find the topological order for the following graph G. **[4]**
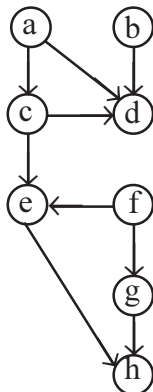
c) What is stable algorithm? List sorting algorithm which are stable. **[2]**

Q3) Attempt all of the following :

a) Write an algorithm to find fast Fourier transferm using divide and conquer strategy. **[4]**

b) Solve the following 011 knapsach instance by LLBB M = 10, P =(8, 5.5), W = (6, 5. 5). **[4]**

c) Justify $4n^2+3n+2=0(n^2)$ **[2]**

Q4) Attempt all of the following :

a) Draw the DFS spanning tree for the following diagram. And List Tree edge and cross edge of the same. Start from vertexs. **[4]**
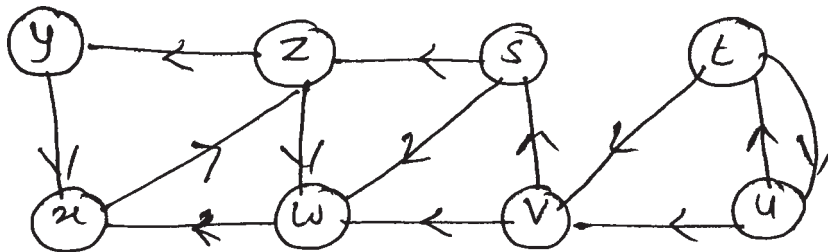
b) Find out the solution for sum of subsets using variable typle size state space tree.

n = 5, m = 50, w = (12, 15, 18, 5, 20) **[4]**

c) Define spanning tree of a given graph. **[2]**

Q5) Attempt all of the following :

a) Find an optimal paranthesization of a matrix chain product whose sequence of dimensions (i.e. chain of production) A_1 is 20×5, A_2 = 5×10, A_3 = 10 × 10 and A_9 is 10×5. **[4]**

b) Discuss the time complexity of quick sort algorithm in best case a west case. **[4]**

c) Write the control of abstraction for greedy method. **[2]**

Q6) Attempt all of the following :

a) Obtain sequence of jobs such that profit is maximized and many jobs can be finished. **[4]**

n=5, p={20, 15, 10, 5, 1}, d = {2, 2, 1, 3, 3}

b) Using prim's algorithm find the minimum spanning tree of following graph G. **[4]**
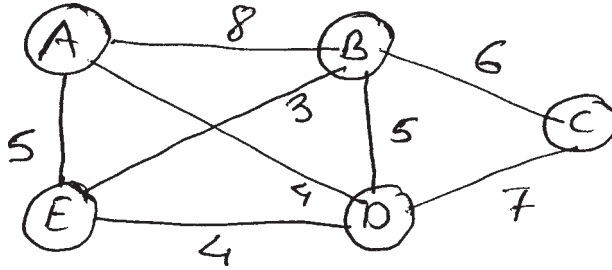
c) What is satisfiability problem? Give its application. **[2]**

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

a) What is the strongly connected components? Find strongly connected components of given graph. **[5]**
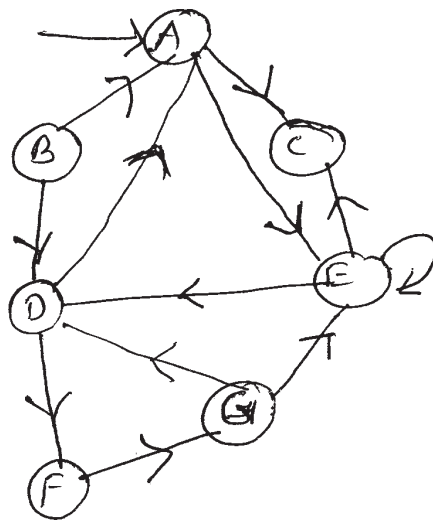
b) Apply the dijkstra's algorithm on the directed graph given below where Vs is the source. **[5]**
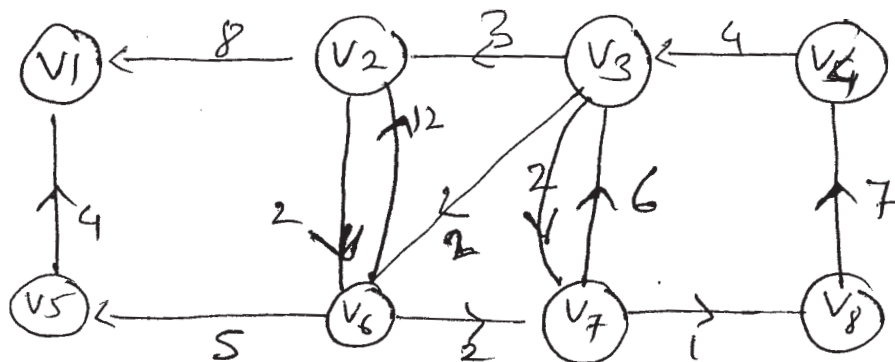
Q8) Attempt all of the following :

a) Find articulation point and Bi-connected component of given graph G.

[5]
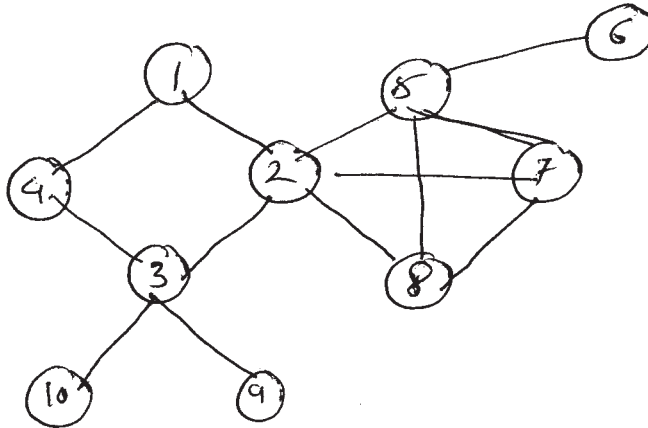
b) Apply Floyd Warshall algorithm to find length of shortest path from vertex 2 to 1 where adjacency matrix of G is. [5]

$$\begin{bmatrix} 0 & 10 & 8 & 15 \\ 19 & 0 & 11 & 14 \\ 7 & 12 & 0 & 7 \\ 16 & 11 & 6 & 0 \end{bmatrix}$$

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[5334] - 302

M.C.A. (Science)

CA-302: OPERATING SYSTEM

(2013 Pattern) (Semester - III)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

1)   *Attempt any five questions*

2)   *Figures to the right indicates full marks.*

Q1) Answer the following:

     a)   Explain any four system calls.   **[4]**

     b)   Explain PCB with example.   **[4]**

     c)   What is semaphore.   **[2]**

Q2) Answer the following:

     a)   Explain free space management method in file system.   **[4]**

     b)   Explain Dining philosopher problem.   **[4]**

     c)   What is P.Thread.   **[2]**

Q3) Answer the following:

     a)   Explain the four necessary conditions for the deadlock to occur.   **[4]**

     b)   Explain contiguous memory allocation method.   **[4]**

     c)   What is logical address?   **[2]**

Q4) Answer the following:

    a)   What is critical section problem? Explain various ways to handle it. **[4]**

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

    c)   What is starvation. **[2]**

Q5) Answer the following:

    a)   Explain process scheduling and different types of schedulers. **[4]**

    b)   Write a short note on file access methods. **[4]**

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

Q6) Answer the following:

    a)   Explain the deadlock recovery method. **[4]**

    b)   Explain the multilevel Queue scheduling. **[4]**

    c)   Define user thread? **[2]**

Q7) Answer the following:

    a)   Consider the following snapshot of system. **[5]**

Process	Allocation			
	A	B	C	D
P_0	0	3	2	4
P_1	1	2	0	1
P_2	0	0	0	0
P_3	3	3	2	2
P_4	1	4	3	2
P_5	2	4	1	4

MAX			
A	B	C	D
6	5	4	4
4	4	4	4
0	0	1	2
3	9	3	4
2	5	3	3
4	6	3	5

Available			
A	B	C	D
1	2	4	5

Answer the following questions using Banker Algorithm.

- What is the need matrix?

- Is the system in safe state?

b) Consider the following snapshot of the system. **[5]**

Process	CPU Burst Time	Arrival Time
P_1	10	0
P_2	5	4
P_3	2	3
P_4	16	5
P_5	8	2

Draw a proper Gantt chart and find average turn around time and waiting time for FCFS and SJF (non preemplus).

Q8) Answer the following:

a) Consider the reference string: **[5]**

7, 5, 6, 2, 9, 5, 7, 6, 2, 7, 6, 5, 2, 7, 2, 7, 8.

Answer 3 frames. Find the number of page fault according to

    i)   MRU

    ii)   Optimal

b)   Let the head moving disk with 200 track numbered from 0 to 199 is currently at 53. Consider the following request.   **[5]**

    100, 98, 183, 37, 122, 14, 124, 65

find the total head movement using

    i)   Look

    ii)   FCFS

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[5334]-303

M.C.A-II

SCIENCE

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 wherever necessary.*

3) *Figures to the right indicate full marks.*

Q1) Attempt the following :

    a)   Explain any four types of system testing.   **[4]**

    b)   Explain McCall's quality factors.   **[4]**

    c)   Define system analysis.   **[2]**

Q2) Attempt the following :

    a)   Explain software measurement in brief.   **[4]**

    b)   Write a note on SDLC model with diagram.   **[4]**

    c)   Define data dictionary.   **[2]**

Q3) Attempt the following :

    a)   Write a note on configuration management.   **[4]**

    b)   Explain testing objectives in detail.   **[4]**

    c)   Define ripple effects.   **[2]**

Q4) Attempt the following :

    a)   Explain role of system analyst.   **[4]**

    b)   Discuss spiral model.   **[4]**

    c)   List the types of maintainance.   **[2]**

Q5) Attempt the following :

    a)   Explain guidelines for input and output design.   **[4]**

    b)   Explain processes of project risk management.   **[4]**

    c)   What is request approval?   **[2]**

Q6) Attempt the following :

    a)   Discuss software crisis in brief.   **[4]**

    b)   Explain prototyping approach.   **[4]**

    c)   Define testing.   **[2]**

Q7) Attempt the following :

    a)   Differentiate between programming in small and programming in large.   **[5]**

    b)   Design a prototype of input screen for entering information in hospital management system.   **[5]**

Q8) Attempt the following :

    a)   Eligibility criteria for university examination for post graduate course is :

        Maharashtra domicile student should acquire minimum 45% marks in basic graduation. Non-Maharashtra domicile student should acquire minimum 55% marks in basic graduation. Draw decision tree and decision table for above case.   **[5]**

b) Bank provides schemes through which people can deposit the money with a bank as a fixed deposit for a certain period of time, the bank pay interest for this period and return money when fixed deposit period is over. Interest rate upon the period as follows:

Fixed deposit Period	Interest rates
3.0 to 180 days	10%
181 to 364 days	11%
1 to 2 years	12.5%
2 to 3 years	14%
more than 3 years	15.5%

Depositor may choose to renew the F.D. for another time period find out entities, draw context level and first level DFD. **[5]**

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[5334]-304

M.C.A. - II (Under Science Faculty)
CA - 304 : JAVA
(2013 Pattern) (Semester - III)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

   1)   *Attempt any five questions.*

   2)   *Neat diagram must be drawn wherever necessary.*

   3)   *Figures to the right indicate full marks.*

Q1) Attempt all of the following:

   a)   What is abstract class? Explain with the help of example.   **[4]**

   b)   Explain wrapper class concept in detail.   **[4]**

   c)   Why Java is called platform - neutral language?   **[2]**

Q2) Attempt all of the following:

   a)   Explain any four applet tag with example.   **[4]**

   b)   Write Java program to choose the maximum of an array of n numbers.**[4]**

   c)   What is the use of final keyword?   **[2]**

Q3) Attempt all of the following:

   a)   Explain Calender class in detail.   **[4]**

   b)   Explain two ways to create threads in Java.   **[4]**

   c)   What is repaint () and update () method in applet?   **[2]**

Q4) Attempt all of the following:

   a)   Explain model view controller architecture in swing.   **[4]**

   b)   Explain anonymous inner class with example.   **[4]**

   c)   List the methods of mouse listener interface.   **[2]**

Q5) Attempt all of the following:

   a)   Explain garbage collection mechanism and finalize method.   **[4]**

   b)   Explain any four methods of FileReader Class.   **[4]**

   c)   Differentiate between break and continue statement.   **[2]**

Q6) Attempt all of the following:

    a)   What is AWT? Explain the various components of AWT. **[4]**

    b)   Write Java program to create a class student with attributes Roll No., Name, Age, Address. Initialize values through parameterized constructor. If age of the student is not between 18 to 20 then generate user-defined exception "Age Not within the Range". **[4]**

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

Q7) Attempt all of the following:

    a)   What is thread? Explain thread synchronisation with suitable example.**[5]**

    b)   Write Java Program to accept a file name and character as command line arguments and replace all occurrences of that character by ∗. Store the result in file "Output .txt". **[5]**

Q8) Attempt all of the following:

    a)   What is package? How to create and access packages in Java? Explain with example. **[5]**

    b)   Write Java program to create an applet which contains a list of courses. Display the selected course in a text box. **[5]**

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Total No. of Questions :8]

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SEAT No. :

[Total No. of Pages : 3

[5334]-305

M.C.A.-II (Science)
CA-307 : NUMERICAL METHODS
(2013 Pattern) (Semester-III)

Time : 3 Hours]   *[Max. Marks : 50*
Instructions to the candidates:
1) *Attempt any 5 questions of the following.*
2) *Use of single-memory, non-programmable scientific calculator is allowed.*
3) *Figures to the right indicate full marks.*

Q1) Attempt the following :

a) Find the positive root of $x^2 - \log_{10}(x) - 12 = 0$ by using Newton Raphson method. **[4]**

b) Using Gaues forward formula, find the value of $f(x)$ when $x = 0.5$ from the data given. **[4]**

x	2	1	0	−1
$f(x)$	100	108	105	110

c) Explain geometric representation of Regula Falsi method. **[2]**

Q2) Attempt the following :

a) Use Lagrange's Interpolation formula to find f(28) from the following table **[4]**

x	24	26	27	30
$f(x)$	1.3802	1.4149	1.4314	1.4772

b) Derive general quadrature formula for Numerical Integration. **[4]**

c) Explain Euler's method for obtaining solution of ordinary differential equation. **[2]**

Q3) Attempt the following :

a) Find square root of 10 corrected upto 3 decimal places by Regula Falsi method. **[4]**

b) Given that $u_{20}=24$, $u_{24}=32$, $u_{28}=35$, $u_{32}=40$, Find u_{25}. **[4]**

c) Find $\Delta^2 (5.2^x)$. **[2]**

P.T.O.

Q4) Attempt the following :

a) Find the square root of 10 by using lusection method perform two interations. **[4]**

b) Using Milne's formula find y(0.8) given that $\frac{dy}{dx} = x - y^2$, $y(0) = 0$, $y(0.2) = 0.02$, $y(0.4) = 0.079$, and $y(0.6) = 0.1762$. **[4]**

c) Find relative error of the number 1.53364. **[2]**

Q5) Attempt the following :

a) Using trapezoidal rule evaluate $\int_0^6 \frac{1}{\sqrt{x+1}} dx$. **[4]**

b) Find the polynomial $f(x)$ where $f(1)=0, f(2)=1, f(4)=9,$ and $f(6)=25$. **[4]**

c) Explain, in brief, the three methods to interpolate the given data. **[2]**

Q6) Attempt the following :

a) Consider the following differential equation $\frac{dy}{dx} = 1 + y^2, y(0) = 0$ use fourth-order Runge-kutta method to find $y(0.2)$. **[4]**

b) Find the population of the year 1936 from the data given below :

Year	1901	1911	1921	1931	1941	1951
Population	12	15	20	27	39	52

[4]

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

Q7) Attempt the following :

a) Given that f(6) = 1.5556, f(y) = 1.690, f(a) = 1.908 and f(12)=2.158. Find f(8) using Newton's dividend difference formula. **[5]**

b) Derive Newtons Backward interpolation formula. **[5]**

Q8) Attempt the following :

    a)   Derive simpson's 1/3rd rule of Integration.   **[5]**

    b)   For the function y = f (x) prove that   **[5]**

$$\Delta^4 y_0 = y_4 - 4y_3 + 6y_2 - 4y_1 + y_0$$

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M.C.A - II
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 Hytime.   **[4]**

   b)   Explain multimedia and hypermedia information coding expert group.**[4]**

   c)   Define multimedia document.   **[2]**

Q2) Answer the following.

   a)   Explain how data is compressed using arithmatic coding.   **[4]**

   b)   Explain the uses of audio in computer applications.   **[4]**

   c)   Give real time example of time based media representation.   **[2]**

Q3) Answer the following.

   a)   Discuss MHEG (Multimedia and Hypermedia expert group)   **[4]**

   b)   Explain Lossless and lossy compression.   **[4]**

   c)   What is track model.   **[2]**

Q4) Answer the following.

    a)   State and explain the goals of multimedia system services.   **[4]**

    b)   Explain differential pulse coded modulation.   **[4]**

    c)   What is   **[2]**

        i)   Bit

        ii)   Pixel

Q5) Answer the following.

    a)   Explain the architecture of an audio signal processing.   **[4]**

    b)   Explain entropy coding.   **[4]**

    c)   Define inter personnel communications.   **[2]**

Q6) Answer the following.

    a)   Explain H.261 video compression techniques.   **[4]**

    b)   Explain time domain Representation of sound.   **[4]**

    c)   Give basic steps of image processing.   **[2]**

Q7) Answer the following.

    a)   Discuss data hiding in Binary Images.   **[5]**

    b)   What is interactive application? How it works over the internet.   **[5]**

Q8) Answer the following.

    a)   Explain linear predictive and Adaptive predictive coding.   **[5]**

    b)   Explain Time and multimedia requirement.   **[5]**

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[5334]-307

M.C.A. (Science) - II
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) Answer the following:

   a)   Explain working of CLR in detail.   **[4]**

   b)   List and explain phases of garbage collection.   **[4]**

   c)   Explain property and indexer with example.   **[2]**

Q2) Answer the following:

   a)   What is private and shared assemblies.   **[4]**

   b)   Explain the purpose of finally block.   **[4]**

   c)   List any four methods of Graphics class.   **[2]**

Q3) Answer the following:

   a)   Explain late binding with reflection.   **[4]**

   b)   Explain the connected architecture of ADO. NET.   **[4]**

   c)   Explain any two most common properties of the control class. **[2]**

Q4) Answer the following:

    a)   List and explain access modifiers in C#. **[4]**

    b)   What is synchronization? Explain thread synchronization using Monitor with example. **[4]**

    c)   List the exception building four keywords. **[2]**

Q5) Answer the following:

    a)   Write a C# program to create object of a class Employee (Name, Id, Salary). Throw an exception 'Negative Id Exception' if Id is negative (Accept the data members from user). **[4]**

    b)   What are delegates. Explain multicast delegates in details. **[4]**

    c)   What are value types? **[2]**

Q6) Answer the following:

    a)   Explain how HTML controls are used in ASP. NET. **[4]**

    b)   List and explain types of dialog boxes using events and methods. **[4]**

    c)   What is an array class used for in C#. **[2]**

Q7) Answer the following:

    a)   How to send argument from command line? Write a program to accept a number from command line and check if it is prime number. **[5]**

    b)   Explain ASP. NET page life cycle. **[5]**

Q8) Answer the following:

    a)   Explain state management and it's Major categories in detail. **[5]**

    b)   What is a stream? Write a C# program to read two file names from user and append the contents of first file to second file. Display contents of first and second file. **[5]**

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[5334] - 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) *Draw neat diagrams wherever necessary.*

Q1) Attempt the following:

   a)   Write short note on: **[4]**

      i)   Trackball

      ii) Plotter

   b)   Explain architecture of Random scan display in detail.   **[4]**

   c)   Explain RGB color model.   **[2]**

Q2) Attempt the following:

   a)   Explain 3D rotation about   **[4]**

      i)   Y-axis

      ii) Z-axis

   b)   Consider a line from (0, 0) to (-6, -6). Draw a line using simple DDA algorithm.   **[4]**

   c)   Write the method in GL to handle mouse event.   **[2]**

Q3) Attempt the following:

    a)   Define clipping. Explain any clipping algorithm in detail.   **[4]**

    b)   Explain beam penetration and shadows mask technique in detail.   **[4]**

    c)   Differentiate convex and concave polygons.   **[2]**

Q4) Attempt the following:

    a)   What is polygon filling? Explain Edge fill algorithm.   **[4]**

    b)   Explain the terms: **[4]**

        i)   Pick

        ii)   b-spline curve

    c)   What is BSP Tree?   **[2]**

Q5) Attempt the following:

    a)   Consider a line A (2, 3) and B(8, 10). Obtain co-ordinates of transformed line using transformation matrix $[T] = \begin{bmatrix} 4 & 0 \\ 0 & 1 \end{bmatrix}$.   **[4]**

    b)   Explain 2D viewing pipeline with diagram.   **[4]**

    c)   List disadvantages of painter's algorithm.   **[2]**

Q6) Attempt the following:

    a)   Explain Cyrus-Beck line clipping algorithm.   **[4]**

    b)   Explain Sutherland-Hodgeman algorithm.   **[4]**

    c)   List two different types of projection.   **[2]**

Q7) Attempt the following:

    a)   Which are different interpolative shading methods? Explain any two methods in detail. **[5]**

    b)   Write and explain any circle generation algorithm. **[5]**

Q8) Attmept the following:

    a)   Explain Z-buffer algorithm in detail. **[5]**

    b)   Explain Bezier curves with all properties. **[5]**

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[5334]-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 five questions.

2) Figures to the right side indicate full marks.

3) Neat diagrams must be drawn wherever necessary.

Q1) Answer the following :

a)   What is Queued and Non-Queued messages?   **[4]**

b)   What are the methods to return Device context?   **[4]**

c)   Explain the parameters of Win main function.   **[2]**

Q2) Answer the following :

a)   What is Program Entry Point? Explain use of each parameter. **[4]**

b)   What are the Device Context Attributes?   **[4]**

c)   Write a note on WM-PAINT message.   **[2]**

Q3) Answer the following :

a)   Write a Window procedure to add an Icon to an application. **[4]**

b)   What is a Dialog Box Procedure?   **[4]**

c)   Write use and Syntax of Polyline ( ) function.   **[2]**

Q4) Answer the following :

a)   Write a window procedure to create system menu as File, Open, Save
     and Save As.   **[4]**

b)   What is a caret? Explain its functions.   **[4]**

c)   What is the use of Kill Timer ( ) function.   **[2]**

Q5) Answer the following :

    a)   Differentiate between Modal and Modeless Dialog Box.   **[4]**

    b)   How to get data from clipboard?   **[4]**

    c)   What is the use of Set Timer ( ) function?   **[2]**

Q6) Answer the following :

    a)   What are the elements of multiple Document Interface.   **[4]**

    b)   How to add Icon? and how to get handle for it?   **[4]**

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

Q7) Answer the following :

    a)   Write a Window Procedure to create a push button at the centre of client area and that button should be moved one position up, down, left, right when corresponding arrow keys are pressed.   **[5]**

    b)   What are keystroke messages? What is the use of "message ordering"?   **[5]**

Q8) Write a SDK program to create login screen using text fields and login button.   **[10]**

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[5334] - 403

MCA

(Science Faculty)

CA-403 : Advanced JAVA

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

Time : 3 Hours]   *[Max. Marks :50*

Instructions to candidates:
  a) Attempt any five questions.
  b) Figures to the right side indicate full marks.
  c) Neat diagram must be drawn wherever necessary.

Q1) Attempt the following:
  a) Explain the Bean writing process with examples.   **[4]**
  b) What are directives in JSP? Explain its types.   **[4]**
  c) What are the advantages of Java Beans.   **[2]**

Q2) Attempt the following:
  a) Explain servlet life cycle with diagram.   **[4]**
  b) What is JDBC? Explain the architecture of JDBC in detail.   **[4]**
  c) Enlist the methods of collection Hashset & Describe any one in brief.**[2]**

Q3) Attempt the following:
  a) What is a collection framework.   **[4]**
  b) Explain JSP Declaration with example.   **[4]**
  c) What is Metadata? How is it obtained.   **[2]**

Q4) Attempt the following:

    a)   List types of JDBC drivers. Explain 2 types in detail. **[4]**

    b)   Write a Java program to read n strings in to Arraylist collection. Display the elements of collection in reverse order? **[4]**

    c)   What is the security Issues in servlet. **[2]**

Q5) Attempt the following:

    a)   What is Inet Address class? Explain any two method of Inet Address class. **[4]**

    b)   Explain URL connection class and its methods with an example. **[4]**

    c)   What is EJB? List EJB types. **[2]**

Q6) Attempt the following:

    a)   List and Explain the types of servlets. **[4]**

    b)   Write a short note on session tracking. **[4]**

    c)   What are JSP scripting element? Describe each in brief. **[2]**

Q7) Attempt the following:

    a)   Write a program using JSP tags to compute Factorial of given number.**[5]**

    b)   Write a servlet code to get information about the server such as name of server, server port number and server version. **[5]**

Q8) Attempt the following:

    a)   Write a session servlet program to create a from which accepts user information and Find number of visits to the page. **[5]**

    b)   Write a java program to connect the database using JDBC to Find employee with highest salary. Consider the table : Employee (Empno, Empname, Empdesignation, Empsalary). **[5]**

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[5334] - 404

M.C.A. (Science Faculty)

CA - 404 :OBJECT ORIENTED SOFTWARE ENGINEERING

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

Time : 3 Hours]   *[Max. Marks :50*

Instructions to the candidates:

    1)   *Answer any Five of the following.*

    2)   *Neat diagrams must be drawn whenever necessary.*

    3)   *Figures to the right indicate full marks.*

Q1) Attempt the following:

    a)   Draw class diagram for online placement agency like Noukri. com.   **[4]**

    b)   Explain UML architecture with diagram.   **[4]**

    c)   What is use of extend relation in usecase diagram.   **[2]**

Q2) Attempt the following:

    a)   Draw usecase diagram for library system.   **[4]**

    b)   Explain Generalization with examples.   **[4]**

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

Q3) Attempt the following:

    a)   Draw a sequence diagram for online T-shirt purchase from "Mintra. com".   **[4]**

    b)   Write a note on Generic component of object oriented design model.   **[4]**

    c)   Name the elements of component diagram.   **[2]**

Q4) Attempt the following:

  a) Draw object diagram for hospital management system. **[4]**

  b) Explain the phases of UP. **[4]**

  c) What is acceptance testing. **[2]**

Q5) Attempt the following:

  a) Draw state Transition diagram for coffee vending machine. **[4]**

  b) What are the decisions system designer can take? **[4]**

  c) Define Actor. **[2]**

Q6) Attempt the following:

  a) Draw a component & Deployment diagram for online money transfer transaction through ebanking. **[4]**

  b) Describe any four structural elements. **[4]**

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

Q7) Attempt the following:

  a) A system is to be designed for students research program which includes different activities like Industrial visits, Research paper writting, presenting in conferences, publishing in online Journals, Attending student conferences, organising Research Activities etc. There are several groups with 4 to 5 candidates & one faculty guide as per subject, who subjectively rate the performance of every student in a group for all activities & rates for the same. Draw class and collaboration diagram. **[5]**

  b) Discuss the Software Development life cycle. **[5]**

Q8) Attempt all of the following:

    a)   Draw use case and Activity diagram for mobile App "Daily News" helpful for people. It helps people to provide Global News, local news, sports news and also Job openning advertisement for students. For this, person needs to register in app "Daily News". Person should also specify his/ her area of interest in News. For Job opening, how to apply and other information is also provided. **[5]**

    b)   Explain different types of software Testing? **[5]**

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[5334]-405

M.C.A. (Science Faculty)
CA - 407 : CYBER LAW
(2013 Pattern) (Semester - IV) (Credit System)

Time : 3 Hours]   *[Max. Marks : 50*

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

Q1) Attempt the following:

   a)   Explain secure system in detail.   **[4]**

   b)   Write a short note on electronic signature.   **[4]**

   c)   What is infringement.   **[2]**

Q2) Attempt the following:

   a)   What is cyber law. State its objectives.   **[4]**

   b)   Explain various steps in registration of trademarks.   **[4]**

   c)   What is cyber squatting.   **[2]**

Q3) Attempt the following:

   a)   List and explain any four cyber crimes and their penalties.   **[4]**

   b)   Explain the provisions relating to time and place of dispatch and reciept of electronic record.   **[4]**

   c)   What is case solution.   **[2]**

Q4) Attempt the following:

   a)   Explain the ammendments to Indian penal code 1860 under sec 470, 471, 477A, 499.   **[4]**

   b)   Explain rules and regulation of electronic gasetle.   **[4]**

   c)   What is: **[2]**

     i)   Patent

     ii)   Copyright

Q5) Attempt the following:

   a)   Distinguish between trademark and property mark.   **[4]**

   b)   Write short note on Demain Name System.   **[4]**

   c)   State the use of key encryption.   **[2]**

Q6) Attempt the following:

   a)   Why there is need of Bankers Book Evidence Act.   **[4]**

   b)   What are the functions of a controller.   **[4]**

   c)   What do you mean by "Cyber Security".   **[2]**

Q7) Attempt the following:

   a)   State the objectives of Information Technology Act, 2000.   **[5]**

   b)   Explain the Napster Case.   **[5]**

Q8) Attempt the following:

   a)   What is the procedure for suspension of license.   **[5]**

   b)   What is the penalty and compensation for damage of computer and
        computer system.   **[5]**

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[5334]-406

M.C.A. (Science Faculty)
CA - 408 : SOFT COMPUTING
(2013 Pattern) (Semester - IV) (Credit System)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:
   1)   Atteempt any five questions.
   2)   Figures to the right indicates full marks.
   3)   Neat diagram must be drawn wherever necessary.
   4)   Assume suitable data if necessary.

Q1) Attempt the following.

   a)   State the properties to be satisfied for a classical equivalence relation.**[4]**

   b)   Write a short note on Fuzzy orderning.   **[4]**

   c)   What are Genetic Algorithm.   **[2]**

Q2) Attempt the following.

   a)   Explain Aggregation of Fuzzy rules.   **[4]**

   b)   what is feed forward architecture and feedback architecture?   **[4]**

   c)   Define an epoch.   **[2]**

Q3) Attempt the following.
   a)   List the various properties of fuzzyy sets and crisp sets.   **[4]**

   b)   Write a short note on supervised learning   **[4]**

   c)   what is linear error in linear neuron?   **[2]**

Q4) Attempt the following.

   a)   List the Neural Network models, their characteristic and applications.**[4]**

   b)   What is Linguistic Hedge? State the characteristics of Linguistic variables.
                                             [4]

   c)   List any two constituents of soft computing.   **[2]**

Q5) Attempt the following.

a) For the fuzzy relation $\underset{\sim}{R}$

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

Find the λ-cut relation for $\lambda = 0^+$, 0.1, 0.4 and 0.8. **[4]**

b) Explain with diagram the model for Genetic binary threshold logic Neuron. **[4]**

c) Define convex set. **[2]**

Q6) Attempt the following:

a) Explain the basic features involved in charecterizing membership function. **[4]**

b) Explain the α-LMS learning algorithm. **[4]**

c) Differentiate between soft and hard computing. **[2]**

Q7) Attempt the following:

a) State the advantages and limitations of Genetic Algorithm. **[5]**

b) Using the inference apporach, find the membership values for the triangular shapes $\underset{\sim}{I}, \underset{\sim}{R}, \underset{\sim}{E}, \underset{\sim}{IR}$ and $\underset{\sim}{T}$ for a triangle with angles 45°, 55° and 80°. **[5]**

Q8) Attempt the following:

a) Explain five components of ANN. **[5]**

b) Explain different methods of Defuzzification process. **[5]**

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[5334] - 407

M.C.A.

SCIENCE

CA - 409 : ARTIFICIAL INTELLIGENCE

(2013 Pattern) (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) Attempt the following.

    a)   Explain various steps in water jug problem.   **[4]**

    b)   Write a note on Prolog Variables.   **[4]**

    c)   State the advantages of Depth first search.   **[2]**

Q2) Attempt the following.

    a)   Explain with example any four predefined arithmetic functions in PROLOG.   **[4]**

    b)   Write a short note on "Learning from examples (Induction)".   **[4]**

    c)   What is planning. Define hierarchical planning.   **[2]**

Q3) Attempt the following.

    a)   State the important components of script.   **[4]**

    b)   Explain Mean Ends Analysis.   **[4]**

    c)   Define Artificial Intelligence.   **[2]**

Q4) Attempt the following.

    a)   Write a script for robbing a bank.   **[4]**

    b)   Give the components of planning system.   **[4]**

    c)   Convert the following into facts   **[2]**

        i)   Prakash likes food if they are spicy and delicious.

        ii)   The cakes are delicious.

Q5) Attempt the following.

    a)   Write a short note on cuts.   **[4]**

    b)   Explain knowledge representation requirements.   **[4]**

    c)   Define forward and backward chaining.   **[2]**

Q6) Attempt the following.

    a)   What is a cryptarithmatic problem? Explain with proper example.   **[4]**

    b)   Explain the OR graph.   **[4]**

    c)   What is   **[2]**

        i)   Learning

        ii)   MINMAX Search.

Q7) Attempt the following.

    a)   State and prove unification algorithm.   **[5]**

    b)   Construct semantic net representation for   **[5]**

        i)   Pompion (Marcus), Black Smith (Marcus)

        ii)   Meena gave the green flowered vase to her cousine.

Q8) Attempt the following.

    a)   Explain Semantic network with example. **[5]**

    b)   Consider the following English statements and their WFF's equivalent.**[5]**

English Statement	FOPL/WFF'S
Jack owns a dog	$\exists x : dog(x) \wedge$ owns (Jack, x)
Every dog owner is an animal lover	$\forall x : (\exists y : Dog(y) \wedge$ owns (x, y) $\Rightarrow$ Animal Lover (x))
No animal lover kills an animal	$\forall x :$ Animal Lover $(x) \Rightarrow$ ($\forall y :$ Animal $(y) \Rightarrow \sim$ Kills (x, y))
Either Jack or curiosity killed Tuna, the cat	Kills (Jack, Tuna) v Kills (Curiosity, Tuna) Cat (Tuna) $\forall x : (cat(x) \Rightarrow$ Animal (x))

Using Resolution, Prove that curiosity did not kill tuna.

[5334]-501

M.C.A. - III (SCIENCE)
CA - 501 : INTERNET PROGRAMMING
(2013 Pattern) (Semester-V)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

    1)   *Answer any five questions.*

    2)   *Assume suitable data if necessary.*

Q1) Attempt the following:

    a)   How to difine variable in PHP? Explain in detail different scope of variables. **[4]**

    b)   Explain different types of argument passing to functions. **[4]**

    c)   Write note on server sockets layer. **[2]**

Q2) Attempt the following:

    a)   Explain with diagrammatic representation the execution of PHP Script.**[4]**

    b)   Which are different class methods and object methods available in Pear DB. **[4]**

    c)   State the purpose of $ this variable. **[2]**

Q3) Answer the following:

    a)   Explain any two Internet Mail protocol. **[4]**

    b)   Compare session and cookies. **[4]**

    c)   What is type juggling. **[2]**

Q4) Attempt the following:

    a)   Explain in detail file update with example.   **[4]**

    b)   Write advantage of XML over HTML.   **[4]**

    c)   How to define multiline string in PHP?   **[2]**

Q5) Attempt the following:

    a)   Write example of multidimensional array in PHP.   **[4]**

    b)   Write php script to send an email message.   **[4]**

    c)   What is an associative array?   **[2]**

Q6) Answer the following:

    a)   Explain XML document structure.   **[4]**

    b)   Explain abstract class with example.   **[4]**

    c)   How to set permissions of files? Give Example.   **[2]**

Q7) Attempt the following:

    a)   Write a PHP progranm to accept a string and convert it into array & print the array.   **[5]**

    b)   Explain the function fread ( ), fwrite ( ), fgetc ( ), fgets ( ).   **[5]**

Q8) Answer the following:

    a)   Write a short note images with text.   **[5]**

    b)   Write a PHP script for Login page. Embed PHP code in HTML code.**[5]**

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[5334]-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)   *Figures to the right side full marks.*

Q1) Answer the following

  a)   Write a short note on Monitors **[4]**

  b)   Explain the difference between deep and shallow binding of referencing environments. **[4]**

  c)   What is Static chain? What it is used for? **[2]**

Q2) Answer the following

  a)   Explain the data types in LISP **[4]**

  b)   What is the difference between machine language and assembly language? **[4]**

  c)   State one importance of orthogonality. Name the two languages which uses it. **[2]**

Q3) Answer the following

  a)   Write LISP function "length" which takes a list and returns a count of all the top level elements in the list. **[4]**

  b)   What is co-scheduling? What is its purpose? **[4]**

  c)   What are aggregates? Why are they useful? **[2]**

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Q4) Answer the following

    a)   Write a LISP function called "remainder", which takes two positive non-zero numbers, n and m and returns the remainder when n is divided by m. **[4]**

    b)   Describe the common uses of goto statement, and show how to avoid them using structured control-flow alternatives? **[4]**

    c)   What is referencing environment? **[2]**

Q5) Answer the following

    a)   Write a Short note on Backtracking in PROLOG **[4]**

    b)   Consider the following pseudocode **[4]**

        x: integer ; // global

        procedure set (n : integer)

        { x := n}

        Procedure printx

        { write-integer(x); } // display value of x

        Procedure first

        {set(1); printx;}

        Procedure second

        { x: integer;

        { set(2); printx; }

        main

        { set(0); first(); printx; second(); printx; }

        What does this program print if the language uses static scoping ? What does it print with dynamic scoping ? Why?

    c)   What is the purpose of the "private" part of object interface? **[2]**

Q6) Answer the following

a) Explain the implementation of (nonrepeated) multiple inheritance with the help of suitable example and diagram. **[4]**

b) What is display? How it is maintained during a subroutine call? **[4]**

c) Indicate the binding time for each of the following decisions Consider C language) **[2]**

i) The maximum length allowed for constant character string

ii) The address of particular library routine

Q7) Answer the following

a) Write Prolog Program to find factorial of a number. **[5]**

b) Pointer point to dynamic storage allocation in the heap. **[5]**

i) What are the advantages and disadvantages if language does not support deallocation of heap storage?

ii) What are advantages and disadvantages of garbage collection support?

Q8) Answer the following

a) Write Prolog Program to return the nth element of the list **[5]**

b) Write a LISP function called "cube" which takes a number and returns its cube. Use "cube" to rewrite "cube-list" **[5]**

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SEAT No :

[Total No. of Pages : 2

[5334]-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)   What is the data mining application?   **[4]**

    b)   Write short note on Bayes theorem.   **[4]**

    c)   Define' Market Basket analysis'?   **[2]**

Q2) Attempt all the following :

    a)   How does the K-mean clustering algorithm works?   **[4]**

    b)   What are similarity and difference between data warehouse and database?   **[4]**

    c)   Which is the test option available in WEKA?   **[2]**

Q3) Attempt all the following :

    a)   Describe issues handle during data integration.   **[4]**

    b)   Differentiate between agglomerative and divisive clustering method? **[4]**

    c)   What is data cleaning?   **[2]**

Q4) Attempt all the following :

    a)   Write short note on non-linear regression.   **[4]**

    b)   Write short note on cross - validation.   **[4]**

    c)   Define fp-tree.   **[2]**

Q5) Attempt all the following :

    a)   What are web mining applications.   **[4]**

    b)   Explain issues in classification.   **[4]**

    c)   What is the confusion matrix?   **[2]**

Q6) Attempt all the following :

    a)   Describe text mining with example?   **[4]**

    b)   Write short note on OLAP.   **[4]**

    c)   Define a Logistic Regression.   **[2]**

Q7) Attempt all the following :

    a)   Explain Sampling algorithm.   **[5]**

    b)   Explain hierarchical clustering.   **[5]**

Q8) Attempt all the following :

    a)   Explain: Precision and recall in classifier.   **[5]**

    b)   suppose that a data ware house for university consist of the following four dimension: (Student, Course, semester and teacher) and two measure count and avg-grade. When the lower conceptual level (for example, Given student, course and semester teacher combination), the avg-grade measure store the actual course grade of the student at the higher conceptual levels, avg-grade stores the average grade for given combination.

        Draw a snowflake diagram for the data ware house.   **[5]**

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[5334]-504

M.C.A. (Under 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 questions.*
2) *Figures to the right indicates full marks.*
3) *All questions carry equal marks.*

Q1) Attempt the following:

     a)   Explain system view of project management.   **[4]**

     b)   Write a short note on strategic planning & project selection.   **[4]**

     c)   What are triple constraints.   **[2]**

Q2) Attempt the following:

     a)   What is project scope management. What are the processes involved in it.   **[4]**

     b)   What are tools & techniques used for quality control.   **[4]**

     c)   Define the term: Procurement.   **[2]**

Q3) Attempt the following:

     a)   Summarize the processes involved in project integration management.**[4]**

     b)   Explain CPM method in detail.   **[4]**

     c)   Define: **[2]**

         i)   Status Report

         ii)   Progress Report

Q4) Attempt the following:

     a)   Write short note on project phases & project life cycle.   **[4]**

     b)   What are major outcomes for Project Quality Control.   **[4]**

     c)   What is Project? Give project Attributes.   **[2]**

Q5) Attempt the following:

    a)   What are different techniques used for improving project communication.

                                                                                                    [4]

    b)   Explain the various processes involved in Human Resource Management.

                                                                                                      [4]

    c)   Define project Scope statement.   **[2]**

Q6) Attempt the following:

    a)   Write a short note on statement of work.   **[4]**

    b)   State & Explain different categories of Risk.   **[4]**

    c)   What are project stakeholders.   **[2]**

Q7) Attempt the following:

    a)   Write a short note on Deming & his fourteen points of quality management.   **[5]**

    b)   What are various types of cost-estimates.   **[5]**

Q8) Attempt the following:

    a)   Explain AOA|ADM method in detail.   **[5]**

    b)   What type of information goes in Quality Assurance Plan.   **[5]**

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[5334]-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) Draw Block Diagram for Fundamental steps in Digital Image Processing. Describe Image Acquisition.   **[4]**

   b) Discuss spatial filters used for Sharpening.   **[4]**

   c) How Erosion and Dilation operators work?   **[2]**

Q2) a) Define Adjacency. Explain types of adjacency with example.   **[4]**

   b) Explain Unsharp Masking and Hogh Boost Filters.   **[4]**

   c) Write short note on Boundary Extraction.   **[2]**

Q3) a) Explain with example how First-order Derivatives are useful in Image Processing.   **[4]**

   b) Explain Image Enhancement techniques-   **[4]**

      i)   Image Subtraction

      ii)   Image Averaging

   c) What do you mean by m-adjacency?   **[2]**

Q4) a) Write equations for 2-D discrete Fourier Transform and its Inverse?**[4]**

   b) Explain ideal Low pass Filters.   **[4]**

   c) Describe reflection and Translation.   **[2]**

Q5) a)   Discuss the Image Degradation and Restoration Model.   **[4]**

   b)   Write note on Region-based segmentation.   **[4]**

   c)   Explain 4-Directional Chain Code.   **[2]**

Q6) a)   Differentiate Low-Pass and High-Pass Filters.   **[4]**

   b)   How to compute shape numbers for orders n=4,6,8. With example. **[4]**

   c)   Write short Note on Hit or Miss Transformation.   **[2]**

Q7) a)   Explain Open and Close with the help of Diagram.   **[5]**

   b)   Write short note on : Frequency domain Filters.   **[5]**

Q8) a)   Explain Components of a general purpose Image Processing System.

        [5]

   b)   Write Short Note on :   **[5]**

   i)   Adaptive

   ii)   Local Noise Reduction Filter

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[5334]-506

M.C.A - III
SCIENCE
CA - 508 E - Commerce
(2013 Pattern) (Semester - V)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

1) *Answer five questions from following.*

2) *Neat diagrams must be drawn wherever necessary.*

3) *Figures to the right indicate full marks.*

Q1) a) What are the different measures to ensure security. **[4]**

    b) Explain prepaid & postpaid e - payment system. **[4]**

    c) What is Router. **[2]**

Q2) a) Explain OSI model. **[4]**

    b) What is difference between intranet & internet. **[4]**

    c) Define web services. **[2]**

Q3) a) Write a short note on cell relay. **[4]**

    b) Explain mobile agent with example. **[4]**

    c) Which protocol is used by REST full services. **[2]**

Q4) a) Write a short note on web server. **[4]**

b) Explain virtualization techniques. **[4]**

c) Define IPV4. **[2]**

Q5) a) Explain the different strategies for web - auction. **[4]**

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

c) Define smart card. **[2]**

Q6) a) Explain Business oriented e-commerce strategies. **[4]**

b) Defferentiate between Hypertext & Hyper media. **[4]**

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

Q7) a) Explain EDI architecture. **[5]**

b) Write a short note on ATM. **[5]**

Q8) a) What are the different types of e-commerce threats. **[5]**

b) Explain TCP/IP model. **[5]**

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[5334]-507

M.C.A. (Under Science Faculty)
CA - 509 : MOBILE COMPUTING
(2013 Pattern) (Semester-V)

Time : 3 Hours]   *[Max. Marks : 50*

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

Q1) a)   Write a note on spread spectrum technique.   **[4]**

   b)   Explain in detail about mobile and wireless devices with simplified
        reference model.   **[4]**

   c)   Define binding in mobile IP.   **[2]**

Q2) a)   What are the requirements needed for mobile IP?   **[4]**

   b)   Explain the need of small cells in cellular system.   **[4]**

   c)   Explain the advantages of three tier architecture.   **[2]**

Q3) a)   Write a short note on Bluetooth protocol stack.   **[4]**

   b)   What are the applications of RFID?   **[4]**

   c)   Give advantages of user acknowledgement in WTP.   **[2]**

Q4) a)   Describe the system architecture of GSM.   **[4]**

   b)   Explain the value added services through SMS.   **[4]**

   c)   Explain the limitations of GPRS.   **[2]**

Q5) a) Write a short note on tunneling and encapsulation. **[4]**

b) What is dynamic source routing in ad hoc network? **[4]**

c) What is hidden terminal problem? **[2]**

Q6) a) Explain the working of mobile TCP. **[4]**

b) What advantages and disadvantages of snooping TCP? **[4]**

c) What is timeout freezing? **[2]**

Q7) a) With a neat sketch, explain the component and interface of WAP architecture. **[5]**

b) Explain the architecture of wireless telephony application. Also draw a neat labeled diagram for the same. **[5]**

Q8) a) What are the constraint in design application of handheld devices? **[5]**

b) What are the features of mobile phone? **[5]**

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[5334] - 601

M.C.A. (Science) - III

CA-602: SOFTWARE TESTING & QUALITY ASSURANCE

(2013 Pattern) (Semester - VI)

Time : 3 Hours]   *[Max. Marks : 50*

Instructions to the candidates:

    1)   *Attempt any five questions*

    2)   *Figures to the right indicate full marks.*

Q1) Attempt all of the following: **[4+4+2=10]**

    a)   Differentiate between validation and verification.

    b)   What is white Box testing?

    c)   Define quality. List quality factors.

Q2) Attempt all of the following: **[4+4+2=10]**

    a)   Write short note on integration testing.

    b)   What is cyclomatic complexity?

    c)   Give principle & use of pareto diagram.

Q3) Attempt all of the following: **[4+4+2=10]**

    a)   How defects are used for process improvement?

    b)   Write short note on system testing.

    c)   Define test case.

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

    a)   What is quality cost measurement?

    b)   What are uses of run chart?

    c)   Define the term: Defects.

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

    a)   Write short note on six sigma.

    b)   What are scatter diagram patterns.

    c)   List the types of Black Box testing.

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

    a)   What are formal technique review?

    b)   Write short note on load runner.

    c)   Define SQA.

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

    a)   What is quality movement?

    b)   Write short note on ISO 9000 quality standards.

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

    a)   Write short note on statistical quality assurance.

    b)   Draw cause - effect diagram for house paint peeling.

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[5334]-602

M.C.A. (Science)
CA-603 : EMBEDDED SYSTEM
(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) a)   Explain embedded system with suitable example.   **[4]**

   b)   What is role of scheduler in RTOS?   **[4]**

   c)   Define Debugger.   **[2]**

Q2) a)   Discuss the operating system fundamentals in details.   **[4]**

   b)   Define the compiler & cross compiler.   **[4]**

   c)   What is the size of address & data bus of pentium microprocessor?**[2]**

Q3) a)   Write a short note on runtime libraries.   **[4]**

   b)   Define preemptive & non-preemptive kernel in RTOS.   **[4]**

   c)   Identify the addressing modes for following instructions.   **[2]**

      i)   mov a, r_0

      ii)   mov a, $@ r_0$

Q4) a)   Explain any four different types of instructions of 8051 μC with proper
        syntax.   **[4]**

   b)   Explain the scheduting techniques in RTOS.   **[4]**

   c)   Define IDE.   **[2]**

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Q5) a) Explain multiuser multi-tasking operating system. **[4]**

b) Write short note on timers of $8051\mu C$. **[4]**

c) Define event flags. **[2]**

Q6) a) Which parameters have to be considered for designing of target Board? **[4]**

b) Define the terms in modular programming **[4]**

　　i) Processes

　　ii) Threads

c) Define logic analyzer. **[2]**

Q7) a) Explain the compilation process in details. **[5]**

b) Differentiate between microcontroller & microprocessor. **[5]**

Q8) a) Define the terms : **[5]**

　　i) Background system

　　ii) Foreground system

b) Explain the priority inversion in RTOS with proper example. **[5]**

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[5334] - 603

MCA (Under Science Faculty)

CA-604 : Information Security and Audit

(2013 Pattern) (Semester - VI)

Time : 3 Hours]   *[Max. Marks :50*

Instructions to candidates:
  a)   *Attempt any five questions.*
  b)   *All questions carry equal marks.*

Q1) a)   What are advantages and disadvantages of intrusion detection system? **[4]**

     b)   What is malicious software? Explain how to prevent malicious software.**[4]**

     c)   Define threats. **[2]**

Q2) a)   Define firewall? What are its different types? Explain the working of each in detail. **[4]**

     b)   Explain the Token based authentication system. **[4]**

     c)   Differentiate between laws and ethics. **[2]**

Q3) a)   What is information security? Explain its characteristic. **[4]**

     b)   Explain working of DES algorithm. **[4]**

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

Q4) a)   Describe the different ways in which smoke detectors are operating. **[4]**

     b)   Write a note on Reflector and Amplifier Attacks. **[4]**

     c)   Define Risk management. **[2]**

Q5) a) Explain VISA international security model in detail. **[4]**

   b) Write a short note on Honey pots, Honey nets. **[4]**

   c) What are the three types of security policies? **[2]**

Q6) a) Explain the various database security issues. **[4]**

   b) Write a note on biometric authentication. **[4]**

   c) What is SQL injection Attack? **[2]**

Q7) a) Explain in brief 'Host based intrusion detection'. **[5]**

   b) Discuss Security problem for ATM systems. **[5]**

Q8) a) Explain various software security issues **[5]**

   b) What is meaning of cybercrime? Give example of cybercrime. **[5]**

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[5334] - 604

M.C.A.

UNDER SCIENCE FACULTY

CA - 605 : Cloud Computing

(2013 Pattern) (Semester - VI)

Time : 3 Hours]   *[Max. Marks :50*

Instructions to the candidates:

   1)   Answer any five questions.

   2)   All questions carry equal marks.

Q1) a)   Write short note on mobile cloud computing.   **[4]**

   b)   Explain Issues in Inter-cloud environments.   **[4]**

   c)   What is sky computing.   **[2]**

Q2) a)   What is a benefit of cloud computing over traditional computing?   **[4]**

   b)   Explain network virtualization with example.   **[4]**

   c)   What is Wrapping Attack?   **[2]**

Q3) a)   Describe the various cloud applications.   **[4]**

   b)   Explain cloud computing reference model.   **[4]**

   c)   What is a parallel computing?   **[2]**

Q4) a)   Give some examples of cloud computing services.   **[4]**

   b)   What are public clouds? Give services in public clouds.   **[4]**

   c)   What do you mean by High Availability in cloud computing?   **[2]**

Q5) a) define terms Confidentiality and integrity in clouds. **[4]**

b) Write brief notes on HDFS. **[4]**

c) What is the need of virtualization? **[2]**

Q6) a) Discuss the architecture of hyper-V and discuss its use in cloud computing. **[4]**

b) Explain the cloud computing security challenges. **[4]**

c) Enlist Key Players in Cloud Computing Platforms. **[2]**

Q7) a) Explain different threats and vulnerabilities specific to virtual machines. **[5]**

b) Explain the concept of map-reduce. **[5]**

Q8) a) Explain the services provided by the Amazon infrastructure cloud from a user perspective. **[5]**

b) What is secure execution environment and communication in cloud?**[5]**

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