[5134] - 101

M.C.A. - I (Under Science Faculty)
COMPUTER SCIENCE
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: **[4+4+2=10]**

   a)   Define identifier. State the rules for naming an identifier.

   b)   Write a C program to check whether a matrix is an identity matrix (only diagonal elements are 1, others are zero).

   c)   Write appropritate declarations for the following:

      i)   function f which accepts an array of pointers to integers and returns an integer.

      ii) Function f which accepts two strings and returns a string.

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

   a)   What is a function? State the advantages of using functions.

   b)   Write a C program to copy one text file to another by removing extra blank spaces.

   c)   State the purpose of initgraph( ) and closegraph( ).

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

   a)   Explain array of pointers and pointer to array with an example.
   b)   Compare if-else and switch case statement.

P.T.O.

c) Find and justify the output of the following program:

```
void main ( )
{
    int i = 5;
    while (--i)
    {
        if (i <= 2)
            continue:
        printf("%d\t",i);
    }
}
```

Q4) Attempt each of the following: [4+4+2=10]
   a) Explain any four file handling functions in 'C'.
   b) Write a program to display a decimal number in binary using bitwise operators.
   c) Write the printf statement to display the following on screen: The owner said "The item's discount is 10%.

Q5) Attempt each of the following: [4+4+2=10]
   a) What is dynamic memory allocation? How is it done in 'C'?
   b) Write a recursive function to compute m^n. Use this function to display the first 10 powers of 2.
   c) Find the errors in the following code:

```
void Main ( )
{
    int a[n], i;
    for (i = 1; i<=n; i++)
        scanf ("%f", a[i]);
}
```

Q6) Attempt each of the following: [4+4+2=10]
   a) Explain how a structure is declared, initialized and accessed with suitable example.
   b) Write a 'C' program to accept n strings and count number of strings which begin with uppercase letter.
   c) Convert the following 'C' expression to nested if-else;
   a>b? c>d? ans = 10: ans = 15: ans = 20

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

a) What is the purpose of storage class? Explain the storage classes in 'C'.

b) Write a C program to accept and display information of 'n' subjects (code, name, no. of credits) using structure. Search for a specific subjectname and display its details.

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

a) Explain the following:

i) Command line arguments.

ii) Argumented Macro.

b) Draw a flowchart to count occurrences of three digit numbers in an array of n integers and write a 'C' function for the same.

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[5134]-102

M.C.A. - I (Science Faculty)
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 indicate full marks.*
3) *Assume appropriate data if necessary.*
4) *All questions carry equal marks.*

Q1) Attempt each of the following:

a)   Write a short - note on different types of database users.   **[4]**

b)   What is checkpointing? Why is it required?   **[4]**

c)   Explain   **[2]**

   i)   Candidate Key

   ii)   Foreign key

Q2) Attempt each of the following:

a)   What is mapping cardinality? Explain types of mapping cardinality.   **[4]**

b)   What is lossy decomposition? Explain with suitable examples.   **[4]**

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

Q3) Attempt each of the following:

a)   Explain different states of a transaction with diagram.   **[4]**

b)   Compute $(AG)^+$ with the Functional dependencies given below:

   A->B, A->C, CG->H, CG->I, B->H.   **[4]**

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

P.T.O.

Q4) Attempt each of the following:

    a)   Consider the relational database: **[4]**

        Supplier (Sid, Sname, address)

        Parts (Pid, Pname, cost)

        Catalog (Sid, Pid, colour)

        Write relational algebra expressions for the following:

        i)   Find names of suppliers who supply some red parts

        ii)   Find names of all parts whose cost is more than Rs. 250/-

        iii)   Find names of all parts whose colour is green

        iv)   Find name of supplier and parts with its colour and cost

    b)   Define the concept of aggregation. Explain with two suitable examples.**[4]**

    c)   Define: Transaction, schedule. **[2]**

Q5) Attempt each of the following:

    a)   Explain Armstrong's axioms required to compute F^+. **[4]**

    b)   What are the disadvantages of file-oriented system? **[4]**

    c)   R = (A, B, C, D, E). We decompose it into R1 = (A, B, C), R2 = (A,D,E). The set of functional dependencies is: A → BC, CD → E, B → D, E → A. Show that this decomposition is a lossless-join decomposition. **[2]**

Q6) Attempt each of the following:

    a)   What is timestamp ordering protocol? State Thomas' Write rule. **[4]**

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

        i)   BCNF

        ii)   canonical cover

    c)   Define : 1NF, 2NF **[2]**

Q7) Attempt each of the following:

a) Write a short note on deffered update. **[5]**

b) Every view serializable schedule is also conflict serializable. Comment.**[5]**

Q8) Attempt each of the following:

a) 'Bharat Yatra Company' has branches situated all over Maharashtra. Each branch is treated as an independent travelling agency. Each such agency arranges tours. For each tour they have schedules of buses. Each bus is allocated a team of workers as drivers, cleaners, helper, conductor, who are given wages. Passangers book the tours by booking a specific schedule and bus. The agency has many employees working as clerks, agents, stenos who are given monthly salary. Salaried and waged employee record is maintained for one year. Each of the tour can have many schedules based on time of departure and similarly many buses for one tour but each schedule can have only one bus. Draw an ER diagram representing this scenario. **[5]**

b) Consider the following transactions. Find out any two non-serial schedules which are serializable to a serial schedule <T1,T2,T3> **[5]**

T1	T2	T3
Read(a)	Read(c)	Read(a)
a:=a-100;	c:=c*10;	a:=a+a*0.12;
Wrtie(a)	Write(c)	Write(a)
Read(b)	Read(d)	Read(c)
b:=b+100;	d:=d-1000;	c:=c+1000;
Write(b)	Write(d)	Write(c)

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[5134]-103

M.C.A.-I (Under Science Faculty)
COMPUTER SCIENCE
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)   For any sets A, B and C Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$. **[4]**

  b)   Determine whether the function $f(x) = x^2$ from the set of integers to the set of integers is one-to-one. **[4]**

  c)   Define the term Poset. **[2]**

Q2) Attempt each of the following:

  a)   Let $f : \mathbb{R} \to \mathbb{R}$, $f(x) = 2x^2 + 4$ and $g : \mathbb{R} \to \mathbb{R}$, $g(x) = \text{cosec } x$. Find $(fog)(x)$ and $(gof)(x)$. **[4]**

  b)   Let $A = \{x \in R^+ | x \leq 3\}$ and $B = \{x \in R | (x-1)(x+1)(x-2) = 0\}$. Find $A \times B$. **[4]**

  c)   Let $A = \{1, 2, 3, 5, 6, 10, 15, 30\}$ and let R be the relation '/',divides on A. Draw the Hasse diagram of R. **[2]**

Q3) Attempt each of the following:

  a)   Compute the truth table of the statement $(p \wedge q) \Rightarrow (p \vee q)$. **[4]**

  b)   Define the following terms with suitable examples. **[4]**

     i)   Predicates

     ii)   Quantifiers

  c)   If $U = \{0,1,2\}$, find the truth value of $(x) (x^2 - x + 2 = 0)$ **[2]**

Q4) Attempt each of the following:

a) Give a proof by contradiction of theorem "If n is an integer and 3n+2 is odd then n is odd". **[4]**

b) Show that $\forall x P(x) \vee \forall x Q(x)$ and $\forall x (P(x) \vee Q(x))$ 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, $Q(1,1)$ and $Q(2,2)$? **[2]**

Q5) Attempt each of the following:

a) Find G.C.D. of Polynomials $f(x) = x^3 - 3x^2 + 3x - 1$ and $g(x) = x^2 - 1$. **[4]**

b) Find all roots of $x^4 + 2x^3 - 12x^2 - 22x + 40 = 0$. 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) Let a and b any two integers and $n \in$ N. Then show that $a \equiv b$ (modn) if and only if a and b leave the same remainder when divided by n. **[4]**

b) There are precisely n distinct residue classes modulo n. **[4]**

c) Find remainder of 4^8 when divided 5. **[2]**

Q7) Attempt each of the following:

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

   i) Write ρ as a product of disjoint cycles.

   ii) Write ρ as a product of transpositions.

   iii) Determine whether ρ is even or odd

   iv) Find order of ρ

b) Find g.c.d. of 4999 and 1109 and express it in linear combinations of 4999 and 1109. **[5]**

Q8) Attempt each of the following:

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

$$3x - y + 2z = 10$$
$$-x + 2y - z = 12$$
$$4x - 5y + 2z = 6.$$

    b)   Find inverse of matrix $A = \begin{bmatrix} 1 & 2 & 3 \\ -1 & 2 & 0 \\ 2 & 3 & 1 \end{bmatrix}$ by adjoint method. **[5]**

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[5134] - 104

M.C.A. -I (Under 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 indicate full marks.

4) Use of single memory, non-programmable scientific calculator is allowed.

Q1) Attempt each of the following:

a) Solve the recurrence relation $a_r - 12a_{r-2} + 16a_{r-3} = 0$ for $r \geq 3$ and $a_0 = 4$, $a_1 = -8$, $a_2 = -12$. **[4]**

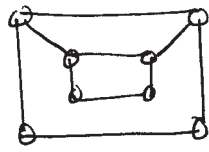b) Using Kruskal's algorithm, find minimal spanning tree of the following connected graph. **[4]**
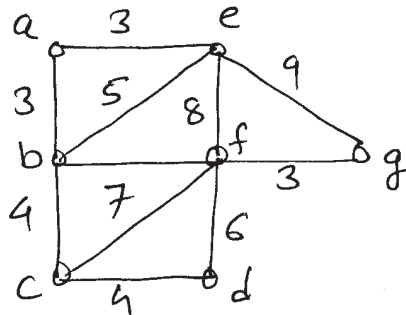
c) State Handshaking Lemma. **[2]**
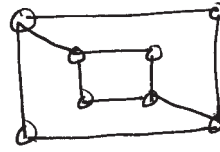
Q2) Attempt each of the following:

a) Find g.c.d. of 191 and 253. Also express it in the form 191 m + 253.n where $m, n \in z$. **[4]**

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

G_1 G_2

c) Draw self complementary graph on 4-vertices. **[2]**

Q3) Attempt each of the following:

a) UsingFleury's algorithm find Euler tour in the following connected graph **[4]**
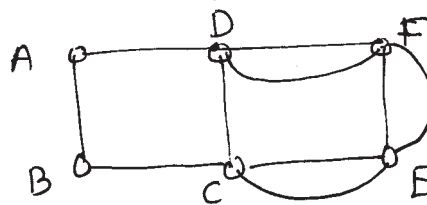
b) Draw the arborescence corresponding to the following expression and write the polish notation **[4]**

$$a + b - \frac{c^d \div e}{f} + 3$$

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

$$\begin{array}{c} \quad\ X\ \ Y\ \ Z\ \ W \\ \begin{array}{c} X \\ Y \\ Z \\ W \end{array} \begin{bmatrix} 1 & 2 & 2 & 0 \\ 2 & 0 & 0 & 2 \\ 2 & 0 & 1 & 1 \\ 0 & 2 & 1 & 1 \end{bmatrix} \end{array}$$

Q4) Attempt each of the following:

a) State and prove Euler's theorem for connected planar graph. **[4]**

b) Obtain preorder and postorder traversal for the following binary tree **[4]**
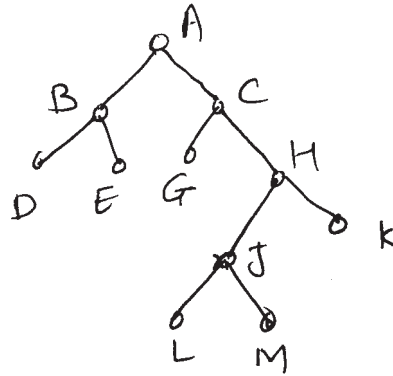
c) Find the complement of the following graph **[2]**
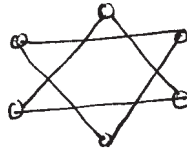
Q5) Attempt each of the following:

a) Define: **[4]**

i) Complete graph

ii) Directed graph

b) Find the remainder when $7^{200} + 11^{800}$ is divided by 101. **[4]**

c) What is edge connectivity of complete graph kn. **[2]**

Q6) Attempt each of the following:

a) Find particular solution of the following recurrence relation **[4]**

$a_n - 4a_{n-2} = 3n.$

b) Prove that every tree has either one or tow centres. **[4]**

c) Find inverse of 5 modulo 8. **[2]**

Q7) Attempt each of the following:

a) Find the fundamental circuits of graph G w.r.t. to tree T. **[5]**

G

T
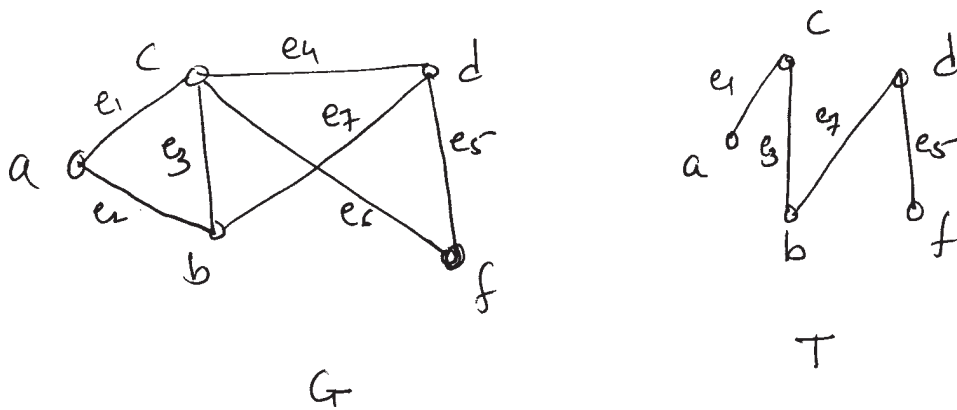
b) Encrypt the message 'HERE IS A MESSAGE' using a caeser cipher. **[5]**

Q8) Attempt each of the following:

a) Explain RSA - cryptosystem. **[5]**

b) State and prove the Max-flow Min-cut theorem. **[5]**

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[5134]-105

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

Time : 3 Hours]   *[Max. Marks : 50*
Instructions to the candidates:
   1)   Attempt any five questions of the following.
   2)   All questions carry equal marks.
   3)   Draw neat diagram wherever necessary.
   4)   Figures to the right indicates full marks.

Q1) a) Draw logic diagram of 3:8 line decoder and explain its working.   **[4]**

   b) Explain stack organization in CPU.   **[4]**

   c) Draw the 4-bit R-2R ladder network for digital to analog conversion and write equation for its output voltage.   **[2]**

Q2) a) What is parallel processing? Explain Arithmatic pipeline method for parallel processing.   **[4]**

   b) Define combinational logic circuit? Explain 4:1 multiplexer using proper logic diagram.Give any one application of multiplexer.   **[4]**

   c) What do you mean by MBR and MAR.   **[2]**

Q3) a) Discuss in brief different modes of data transfer between CPU and peripherals.   **[4]**

   b) Distinguish between RISC and CISC architecture.   **[4]**

   c) "NAND gate is equivalent to bubbled input OR gate" comment.   **[2]**

Q4) a) Define virtual memory . Explain paging system configuration of virtual memory. **[4]**

b) Define serial communication. Explain asynchronous serial communication. Give any one example of asynchronous communication. **[4]**

c) What is meant by don't care condition in K-map? How it can be used for simplification of logic expressions using K-map. **[2]**

Q5) a) Draw block diagram of four functions ALU. Explain it with truth table. **[4]**

b) Explain four segment instruction pipeline with proper flow chart. **[4]**

c) List different segment registors in 8086 microprocessor. **[2]**

Q6) a) Which are the asynchronous inputs of flip-flop. Draw logic diagram of J-K flip-flop with asynchronous inputs and give its truth table. **[4]**

b) What is interrupt. State types of interrupt and explain interrupt service routine. **[4]**

c) How many address lines are required to address 16 GByte of memory assuming each word of 1 byte. **[2]**

Q7) a) Explain direct mapping technique in Cache mapping. **[5]**

b) Using K-map simplify the following boolean equations and draw the logic diagram for simplified expression.

i) $Y = \bar{A}\bar{B}\bar{C}D + \bar{A}B\bar{C}D + AB\bar{C}D + \bar{A}BCD + ABCD + A\bar{B}CD$

ii) $Y = ABC + \bar{A}BC + \bar{A}\bar{B}C + A\bar{B}C$ **[5]**

Q8) a) Draw block diagram of 8086 microprocessor. Explain the function of bus interface unit. **[5]**

b) Explain the concept of memory mapped I/O and I/O mapped I/O. **[5]**

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[5134] - 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.

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

    a)　What is deque? Explain it in detail.

    b)　Explain evaluation of postfix expression using stack with example.

    c)　What is Abstract Data type?

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

    a)　Sort using heap sort-

       25, 35, 18, 9, 46, 70, 48, 23, 78, 12, 95.

    b)　Write short note on operations of singly linked list. Explain with example.

    c)　Define

       i)　BST

       ii)　Data structure

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

a) Find critical path for the following graph:
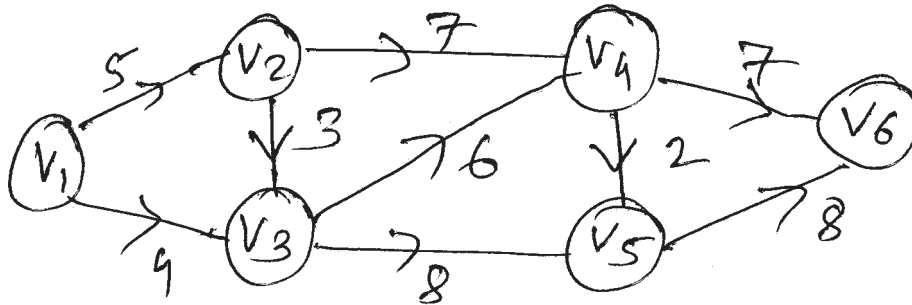
b) Write 'C' function for following:

    i)   Singly linked list creation.

    ii)   Display it & delete node from last position.

c) Find adjacency list for the following graph:
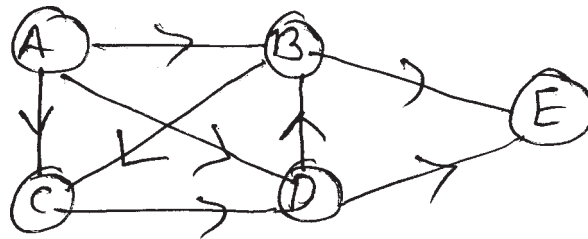
Q4) Attempt all of the following: **[4+4+2=10]**

a) Sort following data using merge sort

    8, 5, 89, 30, 42, 92, 64, 4, 21, 56, 3.

b) Explain use of hash table with example.

c) Define term Big 'O' notation.

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

a) Explain graphically, various situations to insert and delete an item to singly linked list.

b) Explain DFS using stack.

c) Define the terms:

    i)   Spanning tree

    ii)   Directed graph

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

a) Write a 'C' function to insert element in right subtree.

b) Convert infix expression to postfix expression using stack.

c) Define the terms:

i) Backtracking

ii) Primitive data structure

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

a) Consider weight graph. Find shortest path from vertex 'P' to all other vertices using Dijkstra's algorithm.
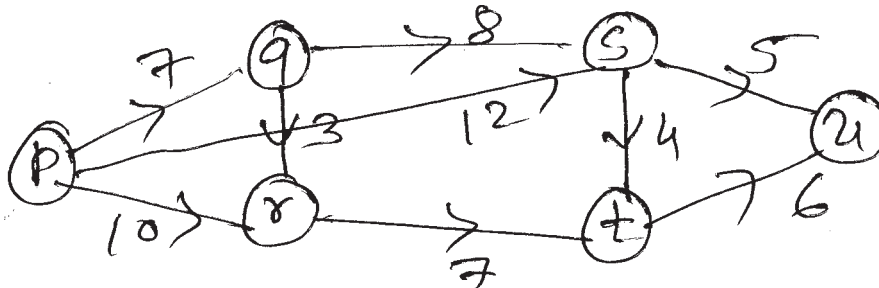
b) Construct BST tree inserting following data sequentially.

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

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

a) Write a C function to add two polynomials.

b) Construct AVL tree for following values.

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

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[5134] - 202

M.C.A. -I (Science)

CA-202: THEORETICAL COMPUTER SCIENCE

(2013 Pattern) (Semester - II)

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

Instructions to the candidates:

1) *Attempt any five of the following out of 8 questions.*

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

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

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

a) Construct DFA for a language which contains all strings ending with 'ab' or 'bc' over {a, b, c}.

b) Describe following sets by regular expressions.

   i) L_1 = set of all strings ending with 'ba' over {a, b}.

   ii) L_2 = set of all strings starting with '0' and ending with 11 over {0, 1}.

   iii) L_3 = {E, 12, 1212, 121212.......}.

c) Define the term kleene closure.

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

a) Convert the following grammer into GNF.

   S → A B

   A → S B | a

   B → A B | b

b) Construct PDA for the following language:

   $L = \{a^n b^{2n} c^k \mid n \geq 1, k \geq 0\}$

c) What are operations performed on sets. Give example of any two operations.

P.T.O.

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

    a)   Construct T.M. for substraction of two unary numbers.

    b)   Construct NFA for regular expression:

        $(0 + 1)^* \; 00 + 1 \; (0 + 1)^*$

    c)   Define symbol and it's types. Explain one type with example.

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

    a)   Design melay machine equivalent to the following moore machine:
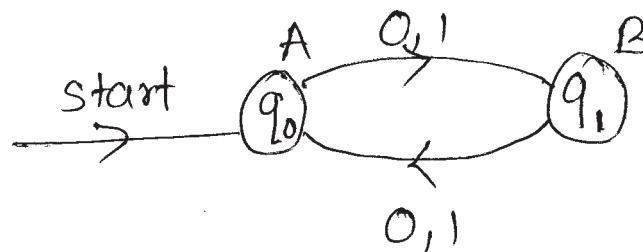
    b)   Construct CFG for $L = \{a^n \; b^{n+2} \; c^m \mid n \geq 1, \; m \geq 0\}$.

    c)   Define the following terms:

        i)   Derivation tree

        ii)   Proper suffix

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

    a)   Construct PDA for $L = \{0^m \; 1^n \; 2^p \mid m, n, p \geq 1, \; m = n + p\}$.

    b)   Define Chomsky Hierarchy of formal languages.

    c)   Construct grammer without E-productions generating L(G) - E for the following grammer.

        $S \rightarrow A \, B, A \rightarrow SA \mid BB \mid bB, \; B \rightarrow b \mid a \, A \mid E$

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

a) Construct minimal DFA for the DFA shown in figure:
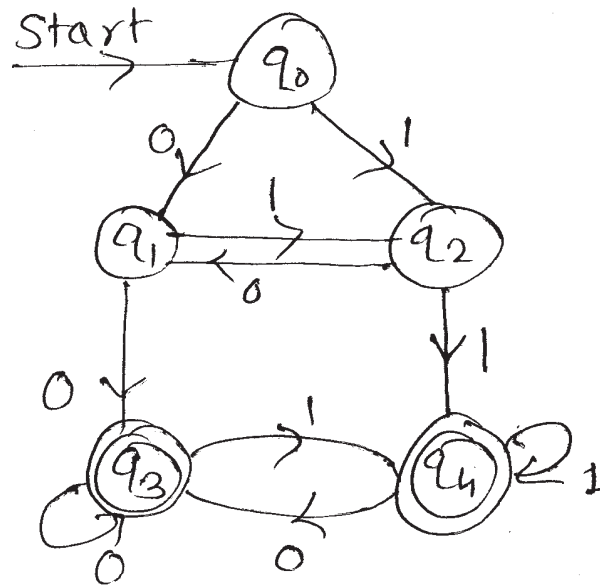
b) Convert following grammer into CNF.

$$S \rightarrow aAab \mid Aba$$

$$A \rightarrow aS \mid bB$$

$$B \rightarrow ASb \mid a$$

c) Check whether '=' is an equivalence relation or not on set of integers.

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

a) Construct T.M. for $L = \{a^n \ b^n \ c^m \ d^m \mid n, m \geq 0\}$.

b) Construct DFA for the following NFA:
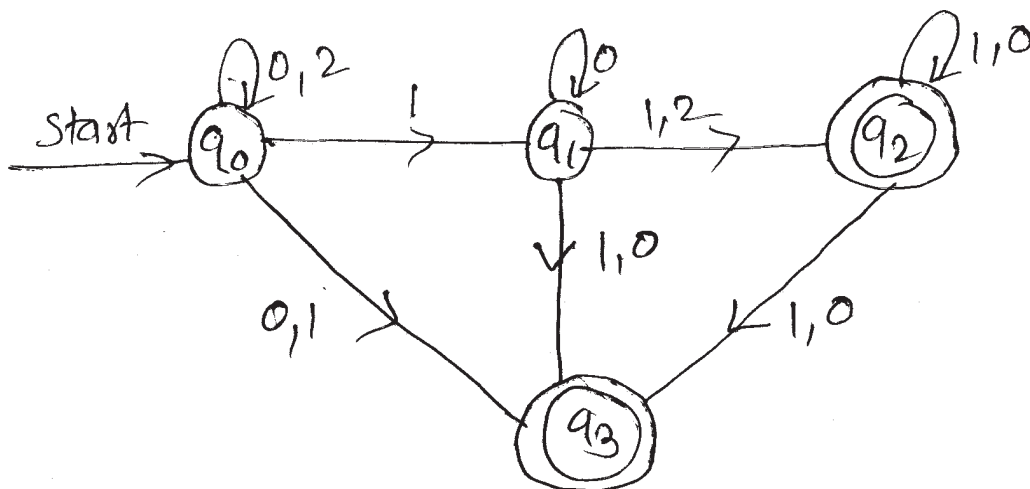
Q8) Attempt all of the following: [5+5=10]

a) Construct PDA equivalent to CFG

S → aAb | aS,

A → Bb | a

B → Sa | b

b) Consider the following grammer.

S→ OAS | O

A → S1A | SS | 10

write leftmost and rightmost derivation for string 000001100. Also construct parse tree.

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[5134] - 203

M.C.A. -I (Science Faculty)
CA-203: OBJECT ORIENTED PROGRAMMING
(C++ Programming)
(2013 Pattern) (Semester - II)

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

Instructions to the candidates:

    1)   Answer any five questions from following.

    2)   Figures to the right indicate full marks.

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

    a)   Briefly explain friend function with its characteristics.

    b)   Explain any 4 manipulators with example.

    c)   State Data types in C++.

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

    a)   Differentiate Between function overloading and over-riding.

    b)   What are the different ways to open the file in C++.

    c)   Give the meaning of following structure.

        i)   int *P = new int (30);

        ii)   int *P = new int;

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

    a)   Explain static Data member and member functions with example.

    b)   Write CPP program which read and write a character from a specified file.

    c)   State different access specifiers.

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

    a)   Write a C++ program using operator overloading to check whether a given number is prime or not.

    b)   Explain the concept of argument with its two types.

    c)   What is derived class.

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

    a)   Briefly explain error handling functions in C++.

    b)   Explain Destructor in derived class.

    c)   What is dynamic memory allocation.

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

    a)   Explain concept of abstract class with example.

    b)   Write a program to store employee names with their designation and netpay to a file on console. Also display employee details from file. Create a class 'employee'.

    c)   Identify errors in the following code-

```
class A
{
    int x, y;
    public:
    void A (int  a = 0, int b)
    {x = a ; y = b;}
    void display ()
    { cout << x<<y; }};
void main ()
{
    A * ptr ;
    ptr → display ();
}
```

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

    a)   Briefly explain enumerated Data type with example.

    b)   What is the recursive function and write a program to find n fibonacci elements using recursive function.

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

    a)   Explain class template with multiple parameter with example.

    b)   Consider following class hierarchy:
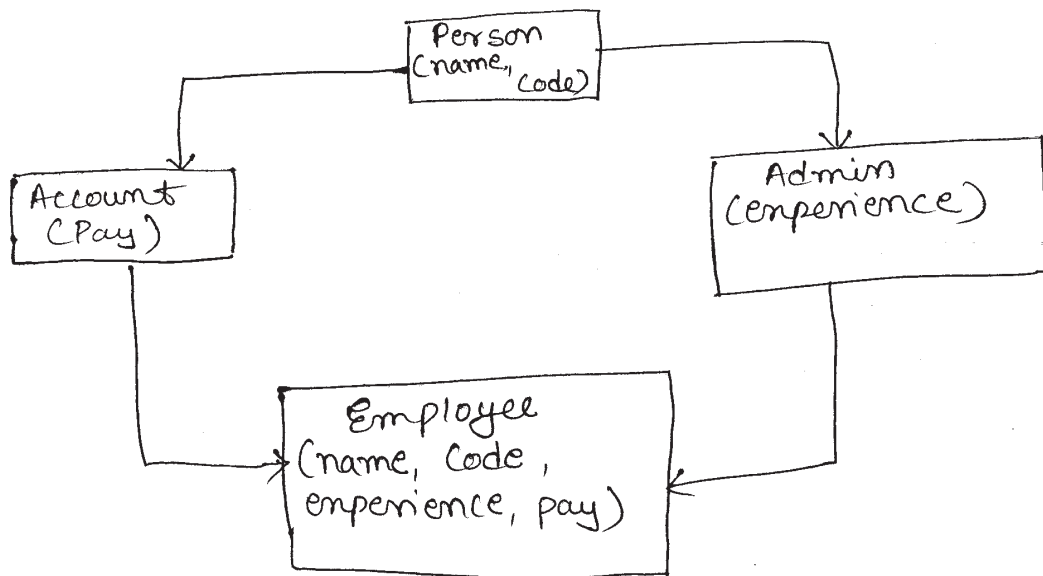
    Write following function

    i)   Accept() and display() for each class.

    ii)   Store information of 'n' employees.

    iii)   Display information of 'n' employees in the descending order of their pay.

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[5134] - 204

M.C.A. -I (Under Science Faculty)
COMPUTER SCIENCE
CA-204: Computer Networks
(2013 Pattern) (Semester - II)

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 indicates full marks.*

Q1) Attempt the following:

a)   What is DNS? How it work?   **[4]**

b)   Write short note on topology. Explain any one type in detail.   **[4]**

c)   Define: **[2]**

   i)   Throughput

   ii)   Latency

Q2) Attempt the following:

a)   What are characteristics of Line coding?   **[4]**

b)   Explain pipelining in detail.   **[4]**

c)   What are standards? Give its types.   **[2]**

Q3) Attempt the following:

a)   Write short note on switched ethernet.   **[4]**

b)   Explain CSMA|CD in detail.   **[4]**

c)   What are types of data flow.   **[2]**

Q4) Attempt the following:

    a)   Describe functionalities of transport layer.   **[4]**

    b)   What are categories of network. Explain any one.   **[4]**

    c)   What is user Agent.   **[2]**

Q5) Attempt the following:

    a)   Construct a CRC message for the given polynomial.   **[4]**

        $x^7 + x^5 + x^4 + x^2 + x^1 + x^0$ and a generator polynomial $x^5 + x^4 + x^1 + x^0$.

    b)   Explain flow control and error control mechanisms in TCP.   **[4]**

    c)   Define virtual circuit.   **[2]**

Q6) Attempt the following:

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

    b)   Explain the advantages of IPV6 over IPV4.   **[4]**

    c)   Define: **[2]**

        i)   BSS

        ii)   ESS

Q7) Attempt the following:

    a)   Write a short note on simplex stop and wait protocol.   **[5]**

    b)   What are properties of routing algorithm.   **[5]**

Q8) Attempt the following:

    a)   Write a short note on transmission impairments.   **[5]**

    b)   Explain HTTP & FTP in detail.   **[5]**

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[5134] - 205

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

CA-205: ADVANCED DATABASE MANAGEMENT SYSTEM
(2013 Pattern) (Semester - II)

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 indicates full marks.*

Q1) Answer the following:

   a)   Write a short note on distributed deadlocks.   **[4]**

   b)   Explain various types of spatial database queries.   **[4]**

   c)   What are object attributes.   **[2]**

Q2) Answer the following:

   a)   Explain 'shared disk multiple CPU' architecture of parallel databases.**[4]**

   b)   Compare ORDBMS and OODBMS.   **[4]**

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

      i)   Authentication.

      ii)   Authorization.

Q3) Answer the following:

   a)   What are advantages & disadvantages of OODBMSs.   **[4]**

   b)   What do you mean by Round-Robin partitioning in query parallelism. Give an example.   **[4]**

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

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Q4) Answer the following:

   a)   What are desired functions of distributed databases.   **[4]**

   b)   What is Firewall? What are different types of firewall.   **[4]**

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

Q5) Answer the following:

   a)   Consider the following relation.   **[4]**

        Bill (Bill-no, Amount, due-date, cust - no) and the set of simple predicates.
        {Amount > 10,000, due - date < '15-09-15'}. Perform Horizontal
        fragmentation of above relation.

   b)   Explain polymorphism and Inheritance in OODB.   **[4]**

   c)   What is parallel databases.   **[2]**

Q6) Answer the following:

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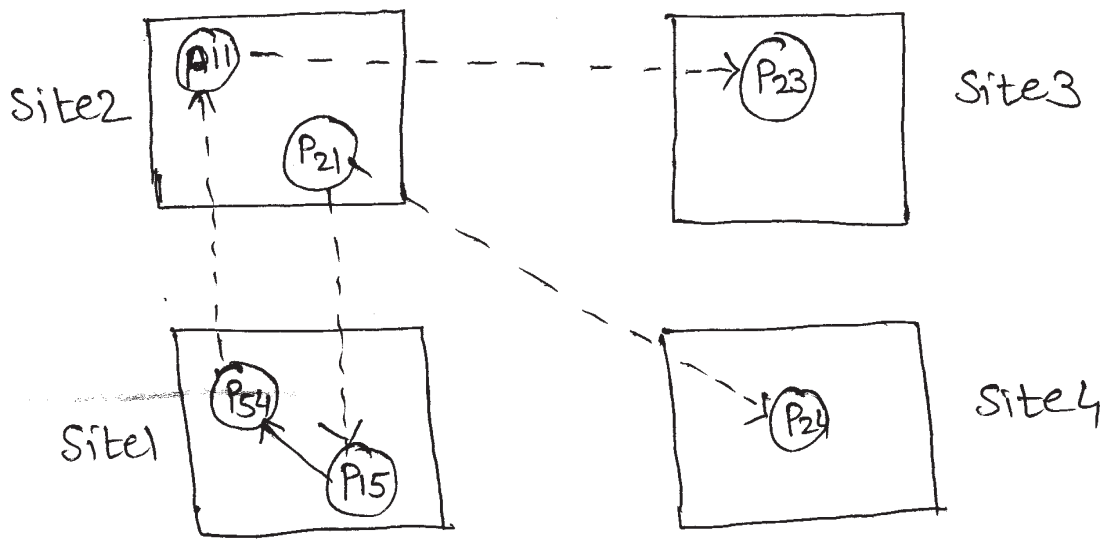
        Check if deadlock exists in the system. If so, find out the sites involved
        in the deadlock.

   b)   What is pipeline parallelism in parallel data base.   **[4]**

   c)   Waht is ODMG?   **[2]**

Q7) Answer the following:

    a)   Using an example illustrate concept of class and class instance.   **[5]**

    b)   What is Audit Trail? What are the uses of audit trail.   **[5]**

Q8) Answer the following:

    a)   Write short note on mobile databases.   **[5]**

    b)   What are implementation challenges of ORDBMS.   **[5]**

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[5134] - 301

M.C.A. -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, 1), (1, 2) & (2, 3). **[4]**

b) Solve the given 0|1 knapsack instance by LCBB method by drawing variable type size space tree. m = 15, n = 4, w = (2, 4, 6, 9) and p = (10, 10 12, 18). **[4]**

c) Write a recursive algorithm to find sum of n numbers. **[2]**

Q2) Attempt all of the following:

a) For the following graph find out the all possible solutions with m = 3.**[4]**
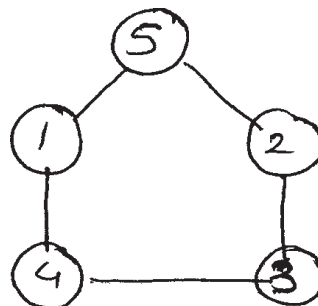
b) Find the topological order for the following graph G. [4]
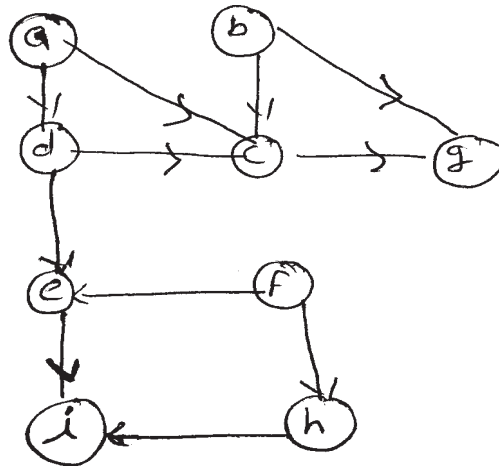
c) Define time complexity and space complexity. [2]

Q3) Attempt all of the following:

a) Write a algorithm for left right Binary exponentiation. [4]

b) Consider the following TSP instance defined by cost matrix obtain the reduced cost matrix. Draw state space tree using LCBB. [4]

$$\begin{bmatrix} \infty & 5 & 8 & 4 & 5 \\ 5 & \infty & 7 & 4 & 5 \\ 8 & 7 & \infty & 8 & 6 \\ 4 & 4 & 8 & \infty & 8 \\ 5 & 5 & 6 & 8 & \infty \end{bmatrix}$$

c) Order the following functions in ascending order of their growth rate and justify $n^2 \log n, 15n^2, 2^n \, e^{\log n}$. [2]

Q4) Attempt all of the following:

a) Draw all Hamiltonian cycle for the following graph [4]
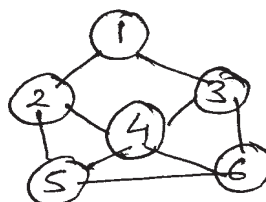
b) Find out the solution for sum of subsets using variable tuple size state space tree. **[4]**

n = 5, m = 30, w = (5, 7, 10, 13, 15).

c) Use Strassen's matrix multiplication to find out the product of given matrix. **[2]**

$$A = \begin{bmatrix} 3 & 2 \\ 2 & 8 \end{bmatrix} \qquad B = \begin{bmatrix} 1 & 5 \\ 9 & 6 \end{bmatrix}$$

Q5) Attempt all of the following:

a) Find an optimal parenthesization of a matrix-chain product whose sequence of dimensions is $A_1 = 10 \times 5$, $A_2 = 5 \times 10$, $A_3 = 10 \times 20$, $A_4 = 20 \times 5$. **[4]**

b) Discuss the time complexity of merge sort algorithm in best case and worst case. **[4]**

c) Find the optimal merge pattern for merging the file of size 2, 3, 5, 7, 9, 13. **[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 = {6, 3, 4, 8, 5}, d = {3, 1, 4, 2, 4}

b) Using Kruskal's algorithm. Find the minimum spanning tree of following graph G. **[4]**
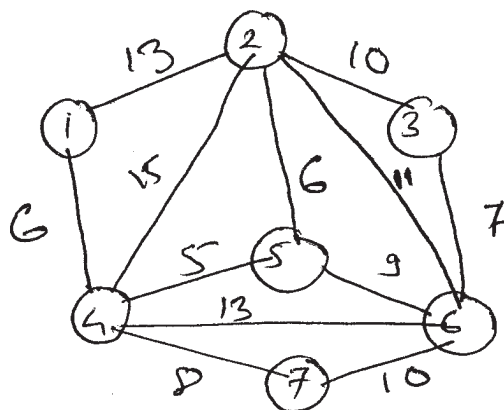
c) State Cook's theorem. **[2]**

Q7) Attempt all of the following:

a) What is the strongly connected component? Find strongly connected component of given graph. **[5]**
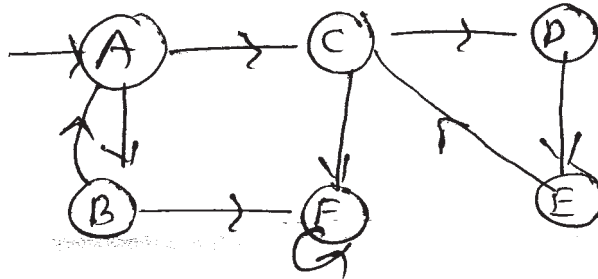
b) Find DFS and BFS for the following graph. **[5]**
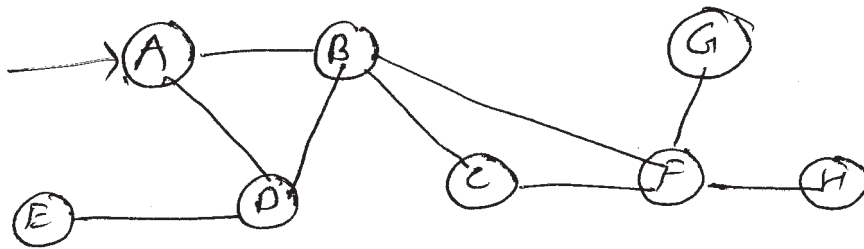
Q8) Attempt all of the following:

a) What is longest common subsequence problem? Determine length of longest common subsequence of **[5]**

$X = \langle 1, 0, 0, 1, 0, 1, 0, 1 \rangle$

$Y = \langle 0, 1, 0, 1, 1, 0, 1, 1, 0 \rangle$

b) Apply the disjkstra's algorithm on the directed graph given below where S is the source. **[5]**

$\mathcal{E}\mathcal{E}\mathcal{E}$
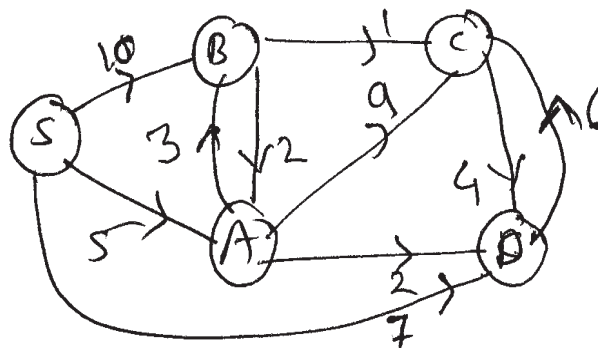
[5134]-302

M.C.A. - II

(SCIENCE FACULTY)

CA- 302 : Operating System Concepts

(2013 Pattern) (Semester - III)

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

Instructions to the candidates:
1) **Answer any five Questions.**
2) **Figures to the right indicates full marks.**

Q1) Answer the following:

    a)   Explain the services provided by the operating system.   **[4]**

    b)   Explain Acyclic graph directory structure.   **[4]**

    c)   Define time quantum of Round Robin algorithm.   **[2]**

Q2) Answer the following: .

    a)   Explain contiguous allocation with its advantages & disadvantages. **[4]**

    b)   Explain deadlock recovery techniques.   **[4]**

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

Q3) Answer the following :

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

    b)   Explain multilevel feedback queue.   **[4]**

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

Q4) Answer the following:

    a)   State & explain the typical attributes of a file.   **[4]**

    b)   Explain Bounded Buffer problem.   **[4]**

    c)   What is memory compaction?   **[2]**

Q5) Answer the following:

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

b) Explain basic operations on file. **[4]**

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

Q6) Answer the following:

a) Explain process scheduling & discuss different types of schedular. **[4]**

b) Explain the working of demand paging. **[4]**

c) Write the benefits of thread? **[2]**

Q7) Answer the following:

a) Consider the following set of processes with length of CPU Burst time & arrival time given in miliseconds. **[5]**

process	Burst time	ArrivalTime	priority
A	5	0	4
B	4	2	2
C	2	2	6 (Highest)
D	4	4	3

What is average waiting time & average turn around time for these processes with pre-emptive priority & non-preemptive priority secheduling.

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

Answer the following questions using Bankers Algorithm.

-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	A	B	C	D
P0	0	0	1	2	0	0	1	2	1	4	2	0
P1	1	1	0	0	1	7	5	0				
P2	1	3	5	4	2	3	5	6				
P3	0	6	3	2	0	6	5	2				
P4	1	0	1	4	1	6	5	6				

Q8) Answer the following:

   a) Let head of moving disk with 200 tracks numbered from 0 to 199 is currently at 100. It has served the previous at 90. consider the queue of request as follows: **[5]**

      23, 89, 132, 42, 187

      compute the total head movements using

      -   FCFS & - SSTF. algorithm

   b) Consider the following reference string **[5]**

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

      How many page fault occur for the following algorithms

      - FIFO & - MRU

      No.of frames = 3

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[5134]-303

M.C.A.-II (Under 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 wherever necessary.*
3) *Figures to the right indicate full marks.*

Q1) Attempt the following:

   a)   What is software? Explain characteristics of the software.   **[4]**

   b)   Explain classical SDLC model.   **[4]**

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

Q2) Attempt the following:

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

   b)   Differentiate between structured interview and unstructured interview.**[4]**

   c)   Define software Engineering.   **[2]**

Q3) Attempt the following:

   a)   Explain software requirement specification (SRS).   **[4]**

   b)   Explain testing principles.   **[4]**

   c)   What is risk analysis?   **[2]**

Q4) Attempt the following:

   a)   Explain advantages and disadvantages of decision tree.   **[4]**

   b)   What is cohesion? Explain any three types of cohesion.   **[4]**

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

Q5) Attempt the following:

    a)   Explain principles of Software Engineering. **[4]**

    b)   Write a note on Reverse Engineering. **[4]**

    c)   What is system analysis? **[2]**

Q6) Attempt the following:

    a)   Explain term project metrics. **[4]**

    b)   What is configuration management? **[4]**

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

Q7) Attempt the following:

    a)   What is data dictionary? Discuss advantages of data dictionary. **[5]**

    b)   Explain methods used in black box testing. **[5]**

Q8) Attempt the following:

    a)   Define a prototype of input screen for generating student information for college admission system and define prototype of output screen to give report information of student admitted for each class & total number of students. **[5]**

    b)   Structure chart focuses on the hierarchy and not a procedural information comment. **[5]**

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[5134]-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 of the following.*
   2)   *Neat diagram must be drawn wherever necessary.*

Q1) Attempt all of the following:

   a)   What is an array & Explain types of an array with example.   **[4]**

   b)   How java differs from c++.   **[4]**

   c)   What is instance of operator.   **[2]**

Q2) Attempt all of the following:

   a)   Explain premitive types of wrappers.   **[4]**

   b)   Write a program to accept two numbers and display maximum of number using swing.   **[4]**

   c)   Distinguish between Input stream and Reader classes.   **[2]**

Q3) Attempt all of the following:

   a)   Explain Life cycle of Applet.   **[4]**

   b)   Write a program to accept 2 strings from users and check given strings are equal or not.   **[4]**

   c)   What is an errors? Types of errors.   **[2]**

Q4) Attempt all of the following:

   a)   Explain J Dialog, J progress Bar.   **[4]**

   b)   What will happen. If we are calling run( ) method of thread object directly instead of calling the start method? Give one example.   **[4]**

   c)   What are input and output streams?   **[2]**

Q5) Attempt all of the following:

    a)   What is Synchronization? When do we use it. Explain with an example.**[4]**

    b)   Draw two circles using graphics applet. **[4]**

    c)   Write swin, features. **[2]**

Q6) Attempt all of the following:

    a)   Write a program to accept file name from user and display occurance of character "s" in the given file. **[4]**

    b)   Write a program to generate random numbers and display it in sorted order. **[4]**

    c)   What is Java byte code. **[2]**

Q7) Attempt all of the following:

    a)   Define an exception called "No Match Exception" that is thrown when a string is not equal to "India". Write a program that uses the exception.**[5]**

    b)   Write a applet program to accept name and display it in alphabetically.**[5]**

Q8) Attempt all of the following:

    a)   Explain Layout manager in applet. **[5]**

    b)   What is collection? Explain collection Frame work. **[5]**

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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 5 questions.*
2) *Figures to the right indicate full marks.*
3) *Use of single-memory, non-programmable scientific calcultor is allowed.*

Q1) a) Estimate a root of the equation $x \sin x = 1$ by Newton-Raphson method. Take $x_0 = 1$ and perform 4 iterations. **[4]**

b) Evaluate $\Delta^2 \left[\dfrac{3x+4}{(x+1)(x+2)} \right]$. **[4]**

c) Write definitions of absolute error and relative error. **[2]**

Q2) a) With usual notations, prove that $(1+\Delta)(1-\nabla) \equiv 1$. **[4]**

b) Use Lagrange's Interpolation formula to find $f(28)$ from the following table

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

[4]

c) Find $\Delta^3 (1+2x)(1+x)(1+5x)$. **[2]**

Q3) a) Find the area of the circle of diameter 84 from the following data. **[4]**

d (diameter)	80	85	90	95	100
A (area)	5026	5674	6362	7088	7854

b) Derive formula for Trapezoidal Rule of Numerical Integration. **[4]**

c) Consider differential equation

$$\frac{dy}{dx} = xy, \quad y(0) = 1.$$

Use Euler's method to compute $y(0.1)$. Take h=0.05 **[2]**

Q4) a) Consider differential equation

$$\frac{dy}{dx} = 1 + xy, \quad y(0) = 2.$$

Find $y(0\cdot1)$ by using Euler's modified method. Perform 4 iterations. **[4]**

b) Use Gauss forward difference formula to compute $f(3.75)$ from the following data. **[4]**

x	2.5	3	3.5	4	4.5	5
$f(x)$	24.145	22.043	20.225	18.644	17.262	16.047

c) Write approximate value of $\dfrac{\pi}{4}$ correct upto 4 decimal places and hence find relative error. **[2]**

Q5) a) Using Newton's backward difference formula, find $y(9)$ from the following table.

x	2	4	6	8	10
y	1.455	3.622	8.861	16.494	24.728

[4]

b) Use Simpson's $\left(\dfrac{1}{3}\right)^{\text{rd}}$ rule to evaluate

$$I = \int_{0}^{\pi/2} \sqrt{\cos x}\, dx$$

by dividing the interval into 4 equal parts. **[4]**

c) Find $\Delta^2\left(5\cdot2^x\right)$. **[2]**

Q6) a) Use Newton's divided difference formula to compute $f(3)$, from the following data. **[4]**

x	0	1	2	5
$f(x)$	2	3	12	147

b) Consider the differential equation

$$\frac{dy}{dx} = 1 + y^2, \quad y(0) = 0$$

Use fourth-order Runge-Kutta method to find $y(0.2)$. **[4]**

c) Use Simpson's $\left(\dfrac{3}{8}\right)^{\text{th}}$ rule to evaluate **[2]**

$$I = \int_{0.1}^{1.3} f(x)\,dx \text{ from the following data}$$

x	0.1	0.3	0.5	0.7	0.9	1.1	1.3
$f(x)$	5.01	5.09	5.25	5.49	5.81	6.21	6.69

Q7) a) Use Regula-Falsi method to estimate a real root of the equation $x^3 - 2x - 5 = 0$ which lies in the interval (2,3). Perform 4 iterations. **[5]**

b) The population of a town in the years are given below.

year	1931	1941	1951	1961	1971
Population (in thousands)	15	20	27	39	52

Find the population of the town in 1946 by using Gauss backward formula. **[5]**

Q8) a) Find the missing terms in the following table **[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) Express $\dfrac{3x^2 + x + 1}{(x-1)(x-2)(x-3)}$ as sum of partial fractions, by using Langrange's interpolation formula. **[5]**

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[5134]-306

M.C.A.-II(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 Multimedia and hypermedia information coding expert group.
        (MHEG)   **[4]**

   b)   Explain synchronization Refernce Model.   **[4]**

   c)   What is   **[2]**

        i)   Bit

        ii)   Pixel

Q2) Answer the following:

   a)   What should be the characteristics of a multimedia interchange model.**[4]**

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

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

Q3) Answer the following:

   a)   Explain Subband coding.   **[4]**

   b)   Explain GIF file format.   **[4]**

   c)   What is SGML parser.   **[2]**

Q4) Answer the following:

   a)   Explain how data is compressed using Huffman encoding scheme. **[4]**

   b)   Write a short note on media stream protocol.   **[4]**

   c)   What is Predictive compression.   **[2]**

Q5) Answer the following:

    a)   Explain Adaptive differential pulse code modulation (ADPCM)   **[4]**

    b)   Explain MPEG 1 video compression standard.   **[4]**

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

Q6) Answer the following:

    a)   Explain (OMFI) Open Media Framework.   **[4]**

    b)   Explain Models of time.   **[4]**

    c)   What is Open Logical Data Unit.   **[2]**

Q7) Answer the following:

    a)   Explain embedded Domain System Design.   **[5]**

    b)   Explain Linear predictive and Adaptive predictive coding.   **[5]**

Q8) Answer the following:

    a)   Explain the different modes in which interchange appears in the architecture of multimedia system.   **[5]**

    b)   Explain the multimedia conferencing architecture.   **[5]**

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[5134]-307

M.C.A. - II (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 side indicate full marks.*
  4) *Assume suitable data, if necessary.*

Q1) a)   Explain Reflection Late Binding in details.   **[4]**

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

   c)   Explain Access Modifiers.   **[2]**

Q2) a)   Explain Boxing and Unboxing with example.   **[4]**

   b)   Describe the working of CLR.   **[4]**

   c)   Explain generation of garbage collection.   **[2]**

Q3) a)   Explain Constructor and Destructor with the help of example.   **[4]**

   b)   Explain in details Garbage collection.   **[4]**

   c)   What are the ADO.NET components.   **[2]**

Q4) a)   Describe the Event with the help of example.   **[4]**

   b)   Explain in brief delegate in c#.   **[4]**

   c)   Attempt the following: **[2]**

      i)   Explain syntax of exception handling?

      ii) What are the two major components of .Net frame work.

Q5) a)   What is assembly. Explain Private and shared assemblies.   **[4]**

   b)   What is Postback and View state in ASP.NET.   **[4]**

   c)   Attempt the following.   **[2]**

      i)   What is Unicast delegate.

      ii) Explain the explicit conversion.

Q6) a) What is validation. Explain various validation controls. **[4]**

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

   c) Attempt the following **[2]**

   i) Explain any 2 common events of the control class.

   ii) What is IIS?

Q7) a) Write a program in C# to throw and handle following exceptions in college application.

   "Minimum marks Exception".Student percentage is less than 40%.

   'Fees Deposite Exception': Minimum 10,000/- deposited for first Installment.

   Display details of each exception. Use required members and methods.**[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]**

Q8) a) Explain Server side and client -side state Management in details. **[5]**

   b) 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]**

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[5134]-401

M.C.A. (Science)
CA - 401 : COMPUTER GRAPHICS
(2013 Pattern) (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) Answer the following:

    a)   State the four components of computer graphics. **[4]**

    b)   Explain 2D rotation about an arbitrary point. **[4]**

    c)   Write note on light pen. **[2]**

Q2) Attempt the following:

    a)   Plot a circle with centre at (0, 0) and radius 4 using mid-point circle generation algorithm. **[4]**

    b)   Explain the types of reflection transformation in 3D transformation. **[4]**

    c)   What is look up table. **[2]**

Q3) Attempt the following:

    a)   Give the advantages and disadvantages of z-buffer algorithm. **[4]**

    b)   Explain window to viewport coordinate transformation. **[4]**

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

        i)   Aspect Ratio.

        ii)   Refreshing of screen.

Q4) Attempt the following:

    a)   State the limitations of sutherland Hodgeman polygon clipping algorithm. **[4]**

    b)   Rotate a triangle *xyz* by angle 60° where triangle has coordinates A(0, 0) B(10, 2) and C(7, 4). **[4]**

    c)   What are fractals. **[2]**

Q5) Attempt the following:

    a)   How is mid-point subdivision algorithm different from when-sutherland algorithm. **[4]**

    b)   Explain different types of perspective projection. **[4]**

    c)   What is point clipping and line clipping. **[2]**

Q6) Attempt the following:

    a)   Which are the methods for character generation? Explain any one method. **[4]**

    b)   Explain CRT with diagram. **[4]**

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

Q7) Attempt the following:

    a)   Prove that the multiplication of 2D transformation matrices for each of the following sequence of operations is commulative. **[5]**

        i)   Two successive rotations

        ii)   Two successive translations

    b)   Explain boundary fill algorithm. **[5]**

Q8) Attempt the following:

    a)   Write short notes on: **[5]**

        i)   Plotters

        ii)   Printers

    b)   Explain Painters Algorithm. **[5]**

[5134]-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 right side indicate full marks.
  3)   Neat diagrams must be drawn wherever necessary.

Q1) Answer the following:

a)   Define MDI. Show the parent - child Hierarchy using Window MDI
     Application.   **[4]**

b)   What is multitasking and multithreading?   **[4]**

c)   Define use of Winlnet and FTP.   **[2]**

Q2) Answer the following:

a)   Write a window procedure to create menu with 3 items File, Background,
     Help. Each of these items has a popup.   **[4]**

b)   Define Dialog Box. Explain Modeless Dialog Box.   **[4]**

c)   State 2 differences between Static Linking and Dynamic Linking.   **[2]**

Q3) Answer the following:

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

     i)   Dialog Box Procedure

     ii)   GDI

b)   Why to use Clipboard? What types of text can be stored in clipboard?**[4]**

c)   Why to use keyboard Accelerators?   **[2]**

Q4) Answer the following:

a) Explain with examples "Queued And Non-Queued Messages". **[4]**

b) Define Device context. Mention two methods of getting to a Device Context Handle. **[4]**

c) Why to use SetTimer( ) & KillTimer( ) function. **[2]**

Q5) Answer the following:

a) Write Window Procedure to collect coordinate from Client Area when the left Mouse button is pressed and join them when the left Mouse button is released. **[4]**

b) What are GDI (Graphical Device Interface) Primitives? **[4]**

c) How to get information about Device Context? **[2]**

Q6) Answer the following:

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

   i) Dynamic Linking

   ii) API

   iii) Use of Message Box ( ) function

   iv) Multitasking

b) Write a note on "WM-PAINT" and "WIN-DESTROY" messages. **[4]**

c) "Each character in Unicode is 16 bits wide rather than 8 bits". Justify True or False. **[2]**

Q7) Write a SDK progarm to create login screen using 2 text fields user name and password button. **[10]**

Q8) Answer the following:

a) Write a Window Procedure for text Editor. You can type in the Window, move the caret. using arrow keys and Erase content on Escape Key. **[5]**

b) What is ODBC? Draw & Explain in detial 'ODBC Architechture'. **[5]**

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[5134] - 403

M.C.A. (Science Faculty)
CA-403: ADVANCED JAVA
(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 the following executing SQL statements: **[4]**

        i)   Prepared statement

        ii)   Callable statement

    b)   Discuss the steps involved in creating the client and the server side of a socket.   **[4]**

    c)   Explain doGet() and doPost() methods.   **[2]**

Q2) Attempt the following:

    a)   What is JDBC? Explain the architecture of JDBC in detail.   **[4]**

    b)   Explain with diagram: Servlet life cycle.   **[4]**

    c)   Enlist the methods of collection tree set and describe any one in breif.**[2]**

Q3) Attempt the following:

    a)   Write a java program to read 20 strings into Arraylist collection. Display all elements in reverse order.   **[4]**

    b)   Enlist types of JDBC drivers. Explain any two types in detail.   **[4]**

    c)   What is the difference between datagram & stream Socket?   **[2]**

Q4) Attempt the following:

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

    b)   Explain the Bean writing process with example. **[4]**

    c)   What is Metadata? How is it obtained. **[2]**

Q5) Attempt the following:

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

    b)   What is a collection Framework. **[4]**

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

Q6) Attempt the following:

    a)   Explain JSP Declaration with example. **[4]**

    b)   Write a program to accept BookID and Bookname of 10 Books and display it in a sorted order. (Use suitable collection). **[4]**

    c)   What is Java Beans? State its two advantages. **[2]**

Q7) Attempt the following:

    a)   Write a program to exchange the data from client to server until client send "BYE" to the server. **[5]**

    b)   Create a 4 page JSP application for shopping cart. Last page must carry vlues from previous 3 pages and customer information. **[5]**

Q8) Attempt the following:

    a)   Write a program to demonstrate passing and retrieving values of parameter to a servlet. **[5]**

    b)   Write a JDBC program to display all details of the student table (studRollno, Studname, Studclass, Studsubject, Studmark). Also perform insertion and updation operation on student database. **[5]**

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[5134] - 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)   *Attempt any five of the following.*

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

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

Q1) Attempt the following:

   a)   Draw use-case diagram for online purchase from Amazon.com.   **[4]**

   b)   Explain inheritance and IS-A relationship with example.   **[4]**

   c)   What is object orientation?   **[2]**

Q2) Attempt the following:

   a)   Draw a class diagram for online purchase of Book from "ebay".   **[4]**

   b)   Explain importance of UML.   **[4]**

   c)   Name the types of relations used in use-case diagram.   **[2]**

Q3) Attempt the following:

   a)   Draw sequence diagram for telephone system.   **[4]**

   b)   Explain the component of Activity diagram.   **[4]**

   c)   What is forward engineering?   **[2]**

Q4) Attempt the following:

   a)   Write a note on UP process.   **[4]**

   b)   Draw object diagram for paying medical bill.   **[4]**

   c)   What is unit testing?   **[2]**

Q5) Attempt the following:

a) Draw state transition diagram for stack. **[4]**

b) Explain the concept of task management component. **[4]**

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

Q6) Attempt the following:

a) Draw a component & deployment diagram for email sending process. **[4]**

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

c) Which are the elements of collaboration diagram? **[2]**

Q7) Attempt the following:

a) Draw use case & activity diagram for mobile App "Krushi Help" for farmers. It helps farmer to sell their crops at the best price available in the market with comparison to other registered dealer. It provides daily updates of leading crops, crop wise list of dealer according to the region, crop quantity required & price associated to particular crop for the day by dealer. This application provides an ease to the farmer to sell his crop. **[5]**

b) Write a note on Agile up. **[5]**

Q8) Attempt the following:

a) The "Passport Office" needs to computerize their system such that all the offices distributed over different cities are connected to the main office located in 'Pune' city. The customer needs to fill a form where he mentions his name, address, phone, date of birth, identity marks etc. The system should take care of issue of new passport & cancellation. Draw class and collaboration diagram. **[5]**

b) Discuss software development life cycle. **[5]**

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[5134] - 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 indicate full marks.*
3) *Neat diagram must be drawn wherever necessary.*

Q1) Attempt the following:

    a)   State the scope and objectives of cyber law.   **[4]**

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

    c)   Define case solution.   **[2]**

Q2) Attempt the following:

    a)   Explain the following terms: **[4]**

        i)   Hacking

        ii)   Tampering

        iii)   Computer virus

        iv)   Trojan Horse

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

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

Q3) Attempt the following:

    a)   Explain the terms framing, linking and in-line linking.   **[4]**

    b)   Write short note on compensation and adjudication.   **[4]**

    c)   What is   **[2]**

        i)   Computer

        ii)   Computer network

Q4) Attempt the following:

    a)   What is cyber squatting and Typo squatting. Differentiate between them.
                                   [4]

    b)   Explain intellectual property with its classification.   **[4]**

    c)   Define: **[2]**

        i)   Public key

        ii)   Private key

Q5) Attempt the following:

    a)   Explain 'Attribution, Acknowledgement and Dispatch of electronic records.   **[4]**

    b)   Explain cyber cell in detail.   **[4]**

    c)   List the uses and abuses of electronic mail.   **[2]**

Q6) Attempt the following:

    a)   Explain trademark wiht the help of diagram.   **[4]**

    b)   Explain in short revocation of digital signature certificate.   **[4]**

    c)   Define the term Intermediary.   **[2]**

Q7) Attempt the following:

    a)   Why there is need of Bankers Book Evidence Act.   **[5]**

    b)   Explain the factors which affect legal recognition of Electronic Records.
                                       [5]

Q8) Attempt the following:

    a)   Explain in detail yahoo case.   **[5]**

    b)   List and explain rules and regulation of electronic gazette.   **[5]**

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[5134]- 406

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

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

Instructions to the candidates:
1) *Attempt any Five questions.*
2) *Figures to right indicate 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 fuzzy equivalence relation. **[4]**

   b) Mention the Algebric properties of Intervals   **[4]**

   c) Define: i) Fitness   **[2]**

            ii) Population

Q2) Attempt the following:

   a) Describe the three properties that Neuronal signal functions should posses. **[4]**

   b) Consider following two fuzzy sets: **[4]**

$$\underset{\sim}{A} = \left\{ \frac{0.3}{x1} + \frac{0.7}{x2} + \frac{1}{x3} \right\} \text{ and}$$

$$\underset{\sim}{B} = \left\{ \frac{0.4}{Y1} + \frac{0.9}{Y2} \right\}$$

   Perform the Cartesian product over these two given fuzzy sets.

   c) What is Feed forward architecture.   **[2]**

Q3) Attempt the following:

a) Define Fuzzy logic and crisp logic with suitable example. **[4]**

b) What is error correction rule and gradient rule? **[4]**

c) State any two types of Neural Network architecture. **[2]**

Q4) Attempt the following:

a) State the important properties of TLN. **[4]**

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

c) What is Soft and Hard computing. **[2]**

Q5) Attempt the following:

a) For the Fuzzy relation R

$$R = \begin{bmatrix} 0.2 & 0.5 & 0.7 & 1 & 0.9 \\ 0.3 & 0.5 & 0.7 & 1 & 0.8 \\ 0.4 & 0.6 & 0.8 & 0.9 & 0.4 \\ 0.9 & 1 & 0.8 & 0.6 & 0.4 \end{bmatrix}$$

Find the λ- cut relation for $\lambda = 0.2, 0.4, 0.7$ & 0.9. **[4]**

b) State the perception learning algorithm. **[4]**

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

Q6) Attempt the following:

a) Write a short note on Induction Reasoning. **[4]**

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

c) List the properties of Fuzzy tolerance relation. **[2]**

Q7) Attempt the following:

a) State the applications of GA. **[5]**

b) Using inference approach, obtain the membership values for triangular shapes (I, R, T) for triangle with angle 40°, 60° & 80° **[5]**

Q8) Attempt the following:

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

b) What is MATLAB? Explain various resources provided by MATLAB. **[5]**

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[5134]- 407

M.C.A. (Science Faculty)
CA-409 : ARTIFICIAL INTELLIGENCE
(2013 Pattern) (Semester - IV) (Credit System)

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 right indicates full marks.*

Q1) a) Explain the concept of Breadth First Search in detail. **[4]**

b) Write a Prolog Program illustrating Recursion. **[4]**

c) Advantages of Breadth First Search. **[2]**

Q2) a) Write a note on " Rate Learning". **[4]**

b) Define the following Terminologies **[4]**

    i) Predicate   ii) Clauses

    iii) Atoms   iv) Characters

c) What is Goal stack Planning. **[2]**

Q3) a) Write a script for Airport. **[4]**

b) Explain AO* algorithm. **[4]**

c) Define AI Technique. **[2]**

Q4) a) Write a short note on " Conceptual dependency". **[4]**

b) What is Planning system. **[4]**

c) Convert the following in to facts

    i) Priya likes food if they are delicious.

    ii) Priya relishes coffee. **[2]**

Q5) a) Explain Backtracking using prolog with example. **[4]**

   b) Discuss the representation using is a relationship. **[4]**

   c) Define Cryptarithmatic problem. **[2]**

Q6) a) Draw the search - tree for water Jug Problem. Discuss the issue in the design of search Programs. **[4]**

   b) Explain constraint satisfaction with Cryptarithmatic problem. **[4]**

   c) Define terms: i) Planning   ii) Learning **[2]**

Q7) a) Describe the advantages of Predicate Logic Represent each of the following in First order logic. **[5]**

   i)   Mary loves everyone.

   ii) Everyone loves Mary.

   iii) Everyone who sees Mary loves Mary.

   b) Short note "Decision Tree". Describe in detail. **[5]**

Q8) a) Explain MINIMAX method for Game playing with example. **[5]**

   b) Give CD representation of following. **[5]**

   i)   John ate ice cream with spoon.

   ii) John ran Yesterday.

   iii) John is a doctor.

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[5134]-501

M.C.A. (SCIENCE) - III
COMPUTER 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)   Write a PHP script for Login page. Embed PHP code in HTML code.**[4]**

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

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

Q2) Attempt the following.

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

  b)   Explain GET and POST methods in PHP.   **[4]**

  c)   Give difference between index array and associative array.   **[2]**

Q3) Attempt the following.

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

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

  c)   Write example of multidimensional array in PHP.   **[2]**

Q4) Attempt the following.

  a)   Write a PHP script for temperature conversion with sticky form.   **[4]**

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

  c)   Write anonymous function for addition of 2 numbers in PHP.   **[2]**

Q5) Attempt the following.

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

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

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

Q6) Attempt the following.

    a)   Explain functionfread(), fwrite(), fgets()   **[4]**

    b)   HTTP is stateless protocol explain. Write methods to main state.   **[4]**

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

Q7) Attempt the following.

    a)   Write PHP script to validate E-mail id with regular expression.   **[5]**

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

Q8) Attempt the following.

    a)   Explain any five drawing function in PHP with syntax.   **[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 works in that Dept.

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[5134]-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) Describe the difference between deep and shallow binding of referencing enviornment. **[4]**

   b) Write functions in LISP for the following: **[4]**

      i) To calculate x to the power y.

      ii) To find factorial of a number.

   c) What is the difference between compilers & preprocessor. **[2]**

Q2) Answer the following:

   a) Explain with example how recurssion & back tracking is implemented in PROLOG. **[4]**

   b) What is an array slice? Give its purpose. **[4]**

   c) Define : Boot strapping. **[2]**

Q3) Answer the following:

   a) Name the categories of control flow mechanism explain any one in detail. **[4]**

   b) What is frame pointer? What it is used for? **[4]**

   c) Give any two equality predicates used in LISP with example. **[2]**

Q4) Answer the following:

a) Consider the following program segment containing dangling reference

{ int *p = new int ;

    int * q= p ;

    .....

    .....

    delete (p);

    ....

}

Show How the dangling reference problem can be solved using tombstone. **[4]**

b) What is subroutines calling sequence? What does it do? What does it mean by subroutine prologue & epilogue. **[4]**

c) What is referencing enviornment. **[2]**

Q5) Answer the following:

a) State & explain the difference between formal & actual parameters. **[4]**

b) Explain the connection between dynamic method binding & polymorphism. **[4]**

c) Expressions in purely Functional languages are said to be referentially transperent "comment". **[2]**

Q6) Answer the following:

a) What is pure virtual function? Explain with example. **[4]**

b) Explain the difference between prefix, infix, postfix notations with example. Name two languages that uses postfix notaion. **[4]**

c) Name two languages which uses orthogonality. **[2]**

Q7) Answer the following:

a) What is tombston? State its importance. Name two languages that uses it. **[5]**

b) How to declare a list in PROLOG. Expalin the following operations performmed on List. **[5]**

    i) Create List

    ii) Append List

    iii) Reverse List

    iv) Find the last element of List

Q8) Answer the following:

a) Consider the following subroutine nesting. **[5]**
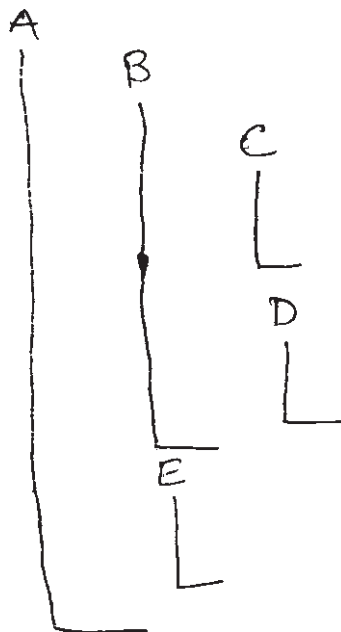
Show stack with all activation record instances including static & dynamic chain for following sequence ⟹ A calls E, E calls B, B calls D and D calls E.

b) Assume the following sentence. **[5]**

"Abhishek only likes easy cources. Science cources are hard. All the cources in the music department are easy. MU 303 is a music cource." Write a PROLOG program to answer the question "Which cource Abhishek likes."

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[5134]-503

M.C.A. - III (Science Faculty)
COMPUTER SCIENCE
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 are the data mining application?   **[4]**
  b)   How does the K-mean clustering algorithm works?   **[4]**
  c)   Define data mart.   **[2]**

Q2) Attempt all the following:
  a)   Write a short note on data structures use in clustering.   **[4]**
  b)   Explain types of association rule.   **[4]**
  c)   Which are the test option available in WEKA?   **[2]**

Q3) Attempt all the following:
  a)   What are the challenges in web mining?   **[4]**
  b)   What are the different way of handling noisy data?   **[4]**
  c)   What are Bayesian classifier?   **[2]**

Q4) Attempt all the following:
  a)   What are data preprocessing techniques? Explain any one.   **[4]**
  b)   Differentiate between OLTP and OLAP.   **[4]**
  c)   Define non-liner regression.   **[2]**

Q5) Attempt all the following:
  a)   Differentiate between text mining and web mining.   **[4]**
  b)   What are the two approaches to avoid overfitting?   **[4]**
  c)   What is clustering?   **[2]**

Q6) Attempt all the following:
  a) Explain the major steps of decision tree classification.   **[4]**
  b) Write short note on boot strap.   **[4]**
  c) Define an FP -tree.   **[2]**

Q7) Attempt all the following:
  a) Explain sampling algorithm with an example.   **[5]**
  b) Explain baseline algorithms zeroR.   **[5]**

Q8) Attempt all the following:
  a) Describe Apriori method.   **[5]**
  b) Suppose a company wants to design a data warehouse to facilitate the
      analysis of moving vehicle in an online analytical process manner. The
      company resisters huge amount of auto movement data in the format of
      auto (Autoid, Location speed, time). Each Autoid represent a vehicle
      associated information (e.g. Vehicle_category,driver_category) and each
      location may be associated with street in city. Assume that a street map
      is available for the city.   **[5]**
    i) Design such data warehouse to facilitate effective online analytical
        processing in multidimensional space.
    ii) Discuss how to develop a method to automatically discover data
        record form the above data repository.

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[5134] - 504

M.C.A. -III (Under Science Faculty)
COMPUTER SCIENCE
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)   Neat diagrams must be drawn wherever necessary.

3)   Figures to the right indicate full marks.

4)   All questions carry equal marks.

Q1) Answer the following:

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

b)   Summarize various methods involved in project selection.   **[4]**

c)   Define control chart. State its use.   **[2]**

Q2) Answer the following:

a)   Write a short note on scope verification.   **[4]**

b)   Explain the process of Quality Assurance in detail.   **[4]**

c)   What is procurment management. Give examples.   **[2]**

Q3) Answer the following:

a)   What is project time management? What are various activities involved in it?   **[4]**

b)   List all tools & techniques used for cost estimation. Explain any one in detail.   **[4]**

c)   State & explain tripal constraints of project management.   **[2]**

Q4) Answer the following:

    a) Write a short note on Responsibility Assignment matrix. **[4]**

    b) State different approaches for improving communications. Explain any one in detail. **[4]**

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

Q5) Answer the following:

    a) State & explain various categories of risks in IT project management.**[4]**

    b) Write a short note on procurment management plan and its contents.**[4]**

    c) Define: **[2]**

        i) Project charter.

        ii) Project management plan.

Q6) Answer the following:

    a) Write short note on staff acquisition. **[4]**

    b) Explain the term performance reporting in details. **[4]**

    c) State any four project attributes. **[2]**

Q7) Answer the following:

    a) What is the use of project charter? What are its contents. **[5]**

    b) State the different approaches for developing WBS (Work Breakdown Structure). Explain any one. **[5]**

Q8) Answer the following:

    a) Explain critical path method in details. **[5]**

    b) What is Earn Value Management (EVM). Explain the terms. **[5]**

        i) Planned Value (PV)

        ii) Earned Value (EV)

        iii) Cost Variance (CV)

        iv) Schedule Variance (SV)

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[5134]-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 5 questions.*
2) *Neat diagrams must be drawn wherever necessary.*
3) *Assume suitable data, if necessary.*
4) *Figures to the right indicate full marks.*

Q1) a) Define 'City-block' and 'Chess board' distance between any two points of a digital image. **[4]**

b) What is Gamma Correction? Explain. **[4]**

c) Define erosion and dilation. **[2]**

Q2) a) State and explain any two properties of DFT. (Discrete Fourier Transform). **[4]**

b) Find the first order derivative of following 1-D image -

$\{0,0,0,1,2,3,4,5,5,5,0\}$. **[2]**

c) Explain 'Hit or Miss" operation with its equation. **[4]**

Q3) a) Discuss different types of edge models. **[4]**

b) How to compute shape numbers? Give suitable example. **[4]**

c) What is the advantage of using Gaussian low pass filter over ideal low pass filter? **[2]**

Q4) a) What are chain codes? What do you mean by normalizing a chain code? **[4]**

b) Write short note on low pass filter for image processing. **[4]**

c) What is structuring element? Draw any two standard shapes. **[2]**

Q5) a)   Explain high pass filtering in frequency domain.   **[4]**

b)   Describe different ways of estimating degrading function.   **[4]**

c)   What is spatial filtering?   **[2]**

Q6) a)   Give different ways of acquiring an image and explain any one in detail.**[4]**

b)   What is difference between point processing and neighbourhood processing? Give one example of each.   **[4]**

c)   Explain the steps in frequency domain Processing of digital Image.   **[2]**

Q7) a)   Give examples of image processing used in manufacturing process. **[5]**

b)   Define 2-D convolution and find out the convolution of following 1-D sequences {1,4,2,5} and {–5,3,1,8}.   **[5]**

Q8) a)   Calculate & plot first and second order derivatives of following image.**[5]**

10	10	10	10	9	8	7	6	5	5	5	5	5	12	5	5	8	8

b)   Give steps for filtering in frequency domain.   **[5]**

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[5134]-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 is credit card payment process?   **[4]**

     b)   What are benefits of e-commerce?   **[4]**

     c)   Define e-signature   **[2]**

Q2) Attempt all the following:

     a)   What are difference between HTTP and HTTPD?   **[4]**

     b)   What are the different measures to ensure security?   **[4]**

     c)   List any two application of EFT.   **[2]**

Q3) Attempt all the following:

     a)   Discuss limitation of EDI.   **[4]**

     b)   Explain order delivery cycle.   **[4]**

     c)   What is B2B?   **[2]**

Q4) Attempt all the following:

    a)   Discuss how online shopping is beneficial to society. **[4]**

    b)   Explain common service center. **[4]**

    c)   Define web portal? **[2]**

Q5) Attempt all the following:

    a)   What are the types of E-Commerce? **[4]**

    b)   Give advantages and disadvantages of internet. **[4]**

    c)   Define post-paid e-payment system. **[2]**

Q6) Attempt all the following:

    a)   Explain legal risk of e-payment system. **[4]**

    b)   Describe Copyright and intellectual Property concept relating to ecommerce. **[4]**

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

Q7) Attempt all the following:

    a)   Explain Cluster of servers. **[5]**

    b)   Explain EDI standard. **[5]**

Q8) Attempt all the following:

    a)   What is ATM? What are advantages and disadvantages of ATM. **[5]**

    b)   Explain E-Commerce threats. **[5]**

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[5134]-507

M.C.A.(Science Faculty)
CA - 509 : Mobile Computing
(2013 Pattern) (Semester - V)

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 indicate full marks.*

Q1) a)   Write note on Indirect TCP.   **[4]**

   b)   What are limitations of mobile computing?   **[4]**

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

Q2) a)   Explain any two protocols in Bluetooth protocol stack.   **[4]**

   b)   What is WIMAX (Wireless broadband)?   **[4]**

   c)   Give any two requirements of mobile IP.   **[2]**

Q3) a)   Explain advantages & disadvantages of message oriented middleware
        (MOM).   **[4]**

   b)   What are resources in android?   **[4]**

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

Q4) a)   What are HLR and VLR? Describe functions of HLR and VLR in call
        routing and roaming.   **[4]**

   b)   Explain Wireless Session Protocol.   **[4]**

   c)   List any four unique characteristics of SMS.   **[2]**

Q5) a)   What is WAP push? How is push different from pull?   **[4]**

   b)   Explain the advantage of selective retransmission in mobile TCP.   **[4]**

   c)   What is mobile station (MS).   **[2]**

Q6) a) Explain MMS Architecture.   **[4]**

b) Describe the various limitations of GPRS.   **[4]**

c) What are supplementary services in GSM?   **[2]**

Q7) a) Explain reverse tunneling.   **[5]**

b) What are recent development in client technologies?   **[5]**

Q8) a) What are the advantages and disadvantages of snooping TCP?   **[5]**

b) List the entities of mobile IP. Explain Home Agent (HA).   **[5]**

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[5134]-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) Answer any five questions.

2) Figures to the right indicate full marks.

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

a) Write short note on software reviews.

b) Define test cases. What are attributes of test cases?

c) What is nature of errors?

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

a) List and explain the Software Quality Factors.

b) What is validation testing?

c) List different types of write box testing.

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

a) Write short note on defect management process.

b) What is brain storming in pareto diagrams?

c) What is the use of cause-effect diagram?

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

a) What are principles of software testing?

b) What do you mean by Statistical Quality assurance?

c) What are features of Winrunner?

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

a)   Write short note on SQA plan.

b)   Differentiate between White box testing and Black box testing.

c)   What is the use of run chart?

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

a)   What are formal technical review?

b)   Write short note on J-unit.

c)   Define SQA.

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

a)   Write short note on ISO 9000 Quality standards.

b)   What are software Metries? State and explain types of Software metries.

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

a)   Draw cause effect diagram for house paint peeling.

b)   Write short note on Quality Cost Measurement.

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[5134]-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) *All symbols have there usual Meaning.*

Q1) a) Explain any four features of Embedded system. **[4]**

     b) Explain critical section code in detail. **[4]**

     c) What is an embedded system? **[2]**

Q2) a) Give Brief Review of Microprocessor family. **[4]**

     b) Explain Block diagram of Microcontroller. **[4]**

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

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

     b) What is processes & Threads? **[4]**

     c) What is event flags? **[2]**

Q4) a) Write short note on Interrupts of 8051 microcontroller. **[4]**

     b) Which parameters are considered while designing target Board. **[4]**

     c) What is task switch? **[2]**

Q5) a) Explain priority inversion with suitable example. **[4]**

b) Explain the Software design cycle. **[4]**

c) What is Task priority? **[2]**

Q6) a) What is Dynamic allocation in modular programming? **[4]**

b) Write short note on scheduling techniques. **[4]**

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

Q7) a) Explain Instruction set of microprocessor with example. **[5]**

b) Explain compilation process in detail. **[5]**

Q8) a) Explain memory organisation of Microcontroller 8051. **[5]**

b) Differentiate between RISC & CISC processors. **[5]**

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[5134] - 603

M.C.A. -III (Science)
COMPUTER SCIENCE
CA-604: Information Security and Audit
(2013 Pattern) (Semester - VI)

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

Instructions to the candidates:

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

Q1) Solve the following:

a) What is information security blueprint? Identify its major components and formulate a cost benefit analysis. **[4]**

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

c) Write the four important functions performed by information security for an organization. **[2]**

Q2) Solve the following:

a) Explain the legal ethical and professional issues related to information security. **[4]**

b) What are the components of risk management? Explain each in detail.**[4]**

c) Describe the different ways in which smoke detectors are operating. **[2]**

Q3) Solve the following:

a) Write short note on trap and trace systems. **[4]**

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

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

Q4) Solve the following:

    a)   How scanning and analysis tools are useful in enforcing information security? **[4]**

    b)   With suitable sketches, explain the working of DES algorithm. **[4]**

    c)   Define steganography. What is the importance in using steganography tools? **[2]**

Q5) Solve the following:

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

    b)   Discuss any two cryptography tools in details. **[4]**

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

Q6) Solve the following:

    a)   Describe in detail the designing of new security architecture. **[4]**

    b)   Explain with example the classical encryption schemes. **[4]**

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

Q7) Solve the following:

    a)   List and describe the four categories of locks in which situation is each types of lock preferred. **[5]**

    b)   Which security protocols are predominantly used in web based electronic commerce? **[5]**

Q8) Solve the following:

    a)   Write a short note on Actine intrusion prevention. **[5]**

    b)   Write note on padded cell system. **[5]**

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[5134] - 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 quesetions carry equal marks.*

Q1) a)   Give benefits of cloud computing.   **[4]**

b)   Enlist and explain essential characteristics of cloud computing.   **[4]**

c)   Why is searching on Google seen as an example of cloud computing?**[2]**

Q2) a)   Write a brief note on cloud computing challenges.   **[4]**

b)   Explain storage and network virtualization with example.   **[4]**

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

Q3) a)   Describe the various cloud applications.   **[4]**

b)   Explain cloud computing reference model.   **[4]**

c)   Define cloud security.   **[2]**

Q4) a)   Explain various reasons for adopting cloud.   **[4]**

b)   What are private clouds. Give services in private 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 note 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 architecture. **[4]**

c) Enlist Key Players in Cloud Computing Platforms. **[2]**

Q7) a) Explain the architecture of cloud file systems (GFS). **[5]**

b) Explain Xen Cloud Platform (XCP) with suitable block diagram. **[5]**

Q8) a) Explain the services provided by the Amazon infrastructure cloud from a user perspective. **[5]**

b) Enlist and explain different issue in inter-cloud environments? **[5]**

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