Total No. of Questions :8]

SEAT No. :

P1253

[Total No. of Pages :3

[4638]-103
M.C. A.(Under Science Faculty)
MATHEMATICS
CA-103: Mathematical Foundation
(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) a) Consider the function $f:\mathbb{Z}\to\mathbb{Z},$ defined by

$$f(x)=|x|+1.$$

Determine if f is one - one and onto. **[4]**

b) Prove the following logical equivalence:

$$(p\to r)\vee(q\to r)\equiv(p\wedge q)\to r$$ **[4]**

c) Consider the set A = {1, 2, 3} and the following permutations on A.

$$\sigma=\begin{bmatrix}1&2&3\\3&1&2\end{bmatrix} \text{ and } \beta=\begin{bmatrix}1&2&3\\2&3&1\end{bmatrix}$$

Compute $\beta^{-1}o\sigma$ **[2]**

Q2) a) Let S be any set. Prove that the subset relation '$\subseteq$' is partial ordering relation on the power set $P(S)$ of S. **[4]**

b) Find the remainder when 5^{46} is divided by 11. **[4]**

c) Consider the set A ={a, b, c, d}. Give an example of a relation on A that is symmetric but not transitive. Justify your answer. **[2]**

P.T.O.

Q3) a) Find reduced row echelon form of a matrix

$$A = \begin{pmatrix} -2 & 4 & 1 & -2 \\ 1 & -3 & 0 & 2 \\ 1 & -5 & 1 & 4 \end{pmatrix}$$ **[4]**

b) Find g.c.d. of the polynomials $x^5 + 1$ and $x^3 + 1$. **[4]**

c) Consider the set of all integers $\mathbb{Z}$ and define '*' as follows:

$a * b = a^b$, where $a, b \in \mathbb{Z}$.

Determine if '$*$' is a binary operation on $\mathbb{Z}$. **[2]**

Q4) a) Consider the set $\mathbb{Z} \times \mathbb{Z}$. Define the relation R on $\mathbb{Z} \times \mathbb{Z}$ as follows:

$(a, b)\ R\ (c, d)$ if and only if $a + d = b + c$.

Determine if R is an equivalence relation on $\mathbb{Z} \times \mathbb{Z}$. **[4]**

b) Decode the message "PYAPESSAEIR", which is encoded using the permutation (1, 4, 9, 3)o(2, 8, 5, 11)o(6, 10, 7). **[4]**

c) Write the negations of the following: **[2]**

i) $\forall\, x, \exists\, y\ (x + y = 1)$,

ii) $\exists\, x, \exists\, y\ (x + y > y^2 + x)$.

Q5) a) Determine whether the following argument is valid or not. If it is valid, then state the corresponding rule of inference and the tautology. :

If I study well and the papers are easy, then I will pass the examination.

If I pass the examination, then I will be promoted to the second year.

$\therefore$ If I will not be promoted to the second year, then I did not study well or the papers were not easy. **[4]**

b) If square of any integer is divided by 4, then prove that the remainder is either 0 or 1. **[4]**

c) Determine whether the following permutation is even or odd.

$$\begin{pmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 \\ 6 & 7 & 5 & 3 & 4 & 2 & 1 \end{pmatrix}$$ **[2]**

Q6) a) Prove that the following argument is valid:

It is not sunny this afternoon and it is colder than yesterday. We will go swimming only if it is sunny. If we do not go swimming, then we will take a canoe trip. If we take a canoe trip, then we will be home by sunset. Therefore, we will be home by sunset. (p. q, r, s t) **[4]**

b) Write the composition table for the operation of multiplication modulo 12 ($\times_{12}$) on $\mathbb{Z}_{12}^{*}$ **[4]**

c) Write the power set of a set A = $\{a, b, c\}$. **[2]**

Q7) a) Find the last two digits in the decimal representation of 7^{283}. **[5]**

b) Solve the following system by matrix inverse method.:

$$2x + 2y + z = 10$$

$$2y + z = 5$$

$$2x + y + 3z = 5$$ **[5]**

Q8) a) Consider the set $X = \{1, -1, i, -i\}$; where $i = \sqrt{-1}$. Determine if multiplication of two numbers is a binary operation on X. Justify your answer. **[5]**

b) Find g.c.d. of the integers 525 and –990 and express it in the form 525m + (–990)n ; where $m, n \in \mathbb{Z}$. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P1254

[Total No. of Pages : 5

[4638] - 104

M.C.A. (Under Science Faculty)

CA-104: CONCRETE MATHEMATICS GRAPH THEORY

(2013 Pattern) (Semester - I)

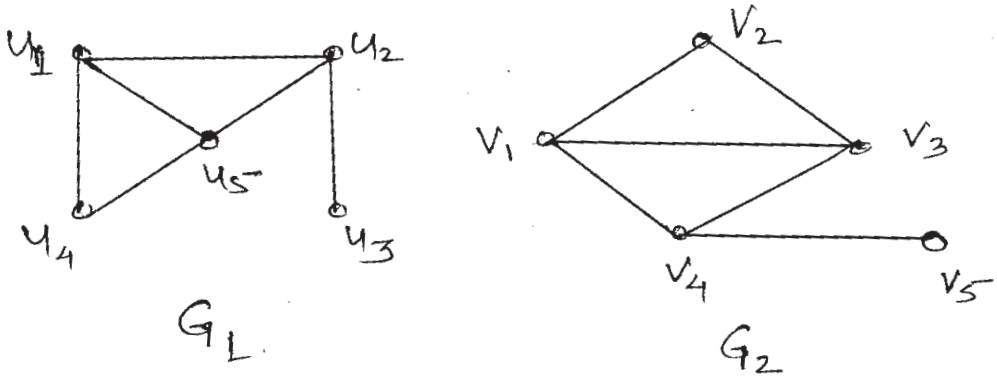
Time : 3 Hours] *[Max. Marks : 50*

Instructions to the candidates:

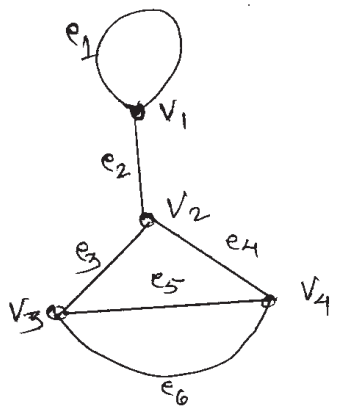
1) ***Attempt any <u>five</u> questions out of eight.***
2) ***All questions carry equal marks.***
3) ***Figures to the right indicate full marks.***
4) ***Use of single-memory, non-programmable scientific calculator is allowed.***

Q1) a) Encrypt the message "80" by using RSA algorithm with key enciphering modulus n = 187 and enciphering exponent k = 23 **[4]**

b) Prove that the following graphs G_1 and G_2 are isomorphic. **[4]**



c) Write the adjacency and incidence matrix of the following graph G. **[2]**



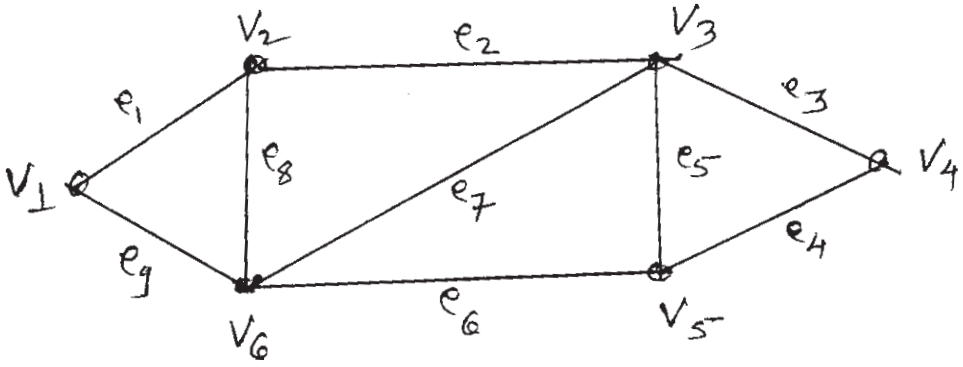
P.T.O.

Q2) a) Prove that any connected graph on n vertices and with (n-1) edges is a tree. **[4]**

b) Solve the recurrence relation: $a_n - 5a_{n-1} + 6a_{n-2} = 3(7^n)$. **[4]**

c) Solve the following linear congruence: $6x \equiv 15 \pmod{21}$. **[2]**

Q3) a) List all cutsets of the following graph G. **[4]**



b) Solve the recurrence relation: **[4]**

$$a_n + a_{n-1} - 13\,a_{n-2} + 6\,a_{n-3} = 0,$$

with $a_o = 1$, $a_1 = 2$, $a_2 = 3$.

c) Write definitions of: **[2]**

i) regular graph

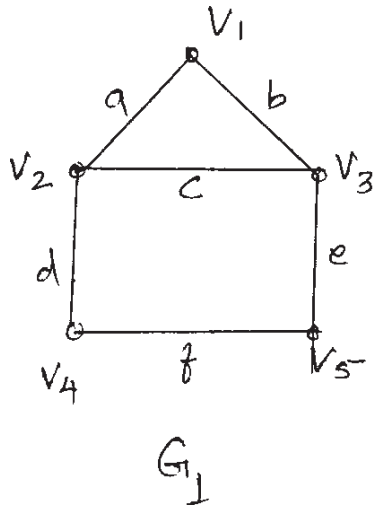
ii) bipartite graph.

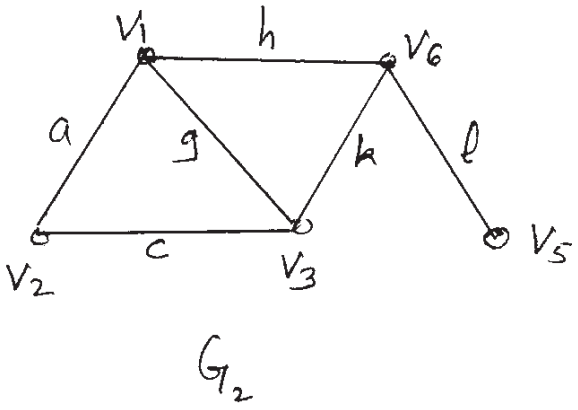
Q4) a) Prove that the complete graph on 5 vertices is non-planar. **[4]**

b) Draw the arborescence of the following expression and write it into polish notation: **[4]**

$$a + \frac{b^5 - e}{d^f + 10}.$$

c) For the given graphs G_1 and G_2, draw $G_1 \cup G_2$. **[2]**





Q5) a) Prove that $(1835)^{1910} + (1986)^{2061}$ is divisible by 7. **[4]**

b) Define the following terms and give one example of each of the following: **[4]**

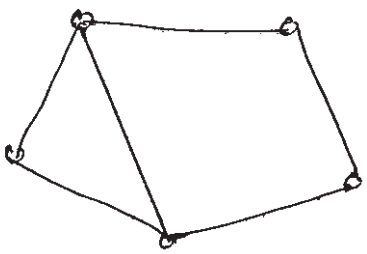
i) Asymmetric diagraph,

ii) A complete a symmetric diagraph.

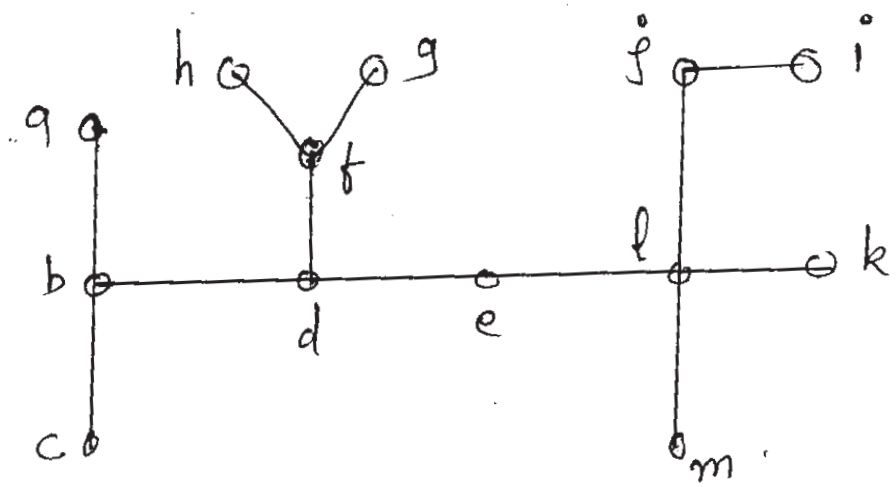
c) Draw the graph G, whose adjacencymatrix is $\begin{bmatrix} 0 & 2 & 0 & 1 \\ 2 & 0 & 1 & 0 \\ 0 & 1 & 0 & 0 \\ 1 & 0 & 0 & 0 \end{bmatrix}$. **[2]**

Q6) a) Using linear cipher $C \equiv 5P + 11 \pmod{2C}$, encrypt the message "141500230125". **[4]**

b) Find the chromatic polynomial of the following graph. **[4]**



c) Consider the following tree. **[2]**



Find eccentricities of the vertices a, g, l and e.

Q7) a) Solve the following system of linear congruences: **[5]**

$x \equiv 1 \pmod 3$

$x \equiv 2 \pmod 5$

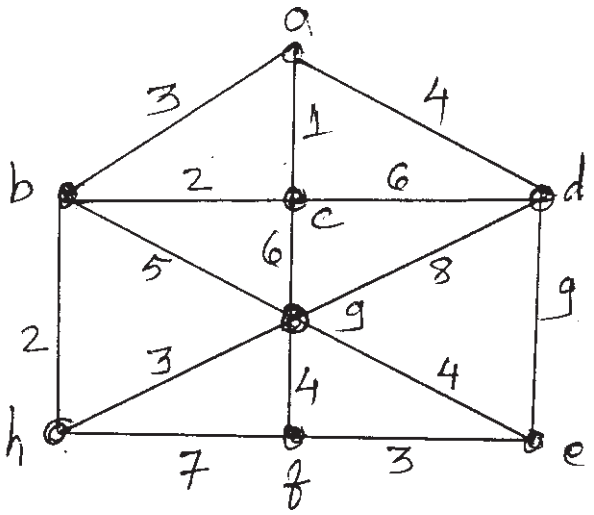
$x \equiv 3 \pmod 7$

b) Use the fusion process to determine whether the graph specified by the following adjacency matrix is connected or not. At every step of the process, give both the corresponding graph and its adjacency matrix.**[5]**

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

Q8) a) Use Prim's algorithm to find minimum weighted spanning tree of the following graph G. **[5]**

G



b) Decrypt the cipher text "1037" with enciphering modulus n = 2419 and deciphering exponent j = 11. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P1255

[Total No. of Pages : 2

[4638] - 105
M.C.A. (Science)
COMPUTER SCIENCE
CA- 105: Computer Organization
(2013 Pattern) (Semester - I)

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) a) Define the following terms related to flip flops: **[4]**

i) Positive edge trigger.

ii) Negative edge trigger.

iii) Clear.

iv) Preset.

b) Explain register organization of CPU. **[4]**

c) State the advantages of parallelism. **[2]**

Q2) a) Write pin functions of USB. State advantages of USB. **[4]**

b) Compare RISC and CISC architecture. **[4]**

c) State the segment registers in 8086. **[2]**

Q3) a) Draw logic diagram of 3 to 8 line decoder using basic gates & explain its working. **[4]**

b) Find the output voltage of four bit binary ladder with digital input **[4]**

i) 1011 and

ii) 1001

Reference voltage 0 = 0v and 1 = 10 v.

P.T.O.

c) Write function of following registers in microprocessor. **[2]**

i) Stack pointer.

ii) Instruction pointer

Q4) a) Draw and explain the functional block diagram of 8086 microprocessor. **[4]**

b) Design a combinational logic circuit that performs 3 bit binary addition, using k -map. **[4]**

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

i) hit ratio

ii) access time; of memory

Q5) a) Write a note on memory hierarchy. **[4]**

b) Explain DMA controller with suitable block diagram. **[4]**

c) State any four features of 8086 microprocessor. **[2]**

Q6) a) Explain concept of RISC pipeline. **[4]**

b) Draw logic diagram and explain 3 bit down counter. **[4]**

c) Write function of following **[2]**

i) Flag register

ii) Instruction decoder

Q7) a) Design a combinational logic circuit with three inputs A, B and C and three outputs X, Y and Z. When the binary inputs are 000, 001, 010, 011. The binary output is one greater than input and when the inputs are 100, 101, 110 and 111; the binary output is one less than input. **[5]**

b) Write a note on 4-segment instruction pipeline. **[5]**

Q8) a) Draw block diagram of I10 interface and explain function of each block. **[5]**

b) The cache access time is 100ns and main memory access time is 700ns. Calculate effective access time and access efficiency, when hit ratio is 95%. **[5]**

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Total No. of Questions :5]

SEAT No. :

P1233

[Total No. of Pages :3

[4638]-13

M.C.A. (Under Science Faculty)

CS-103: MATHEMATICAL FOUNDATIONS

(2008 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***Use of non programmable scientific calculator is allowed.***

Q1) Attempt any four of the following: **[16]**

a) Let A and B be two sets. Show that $A - B = A \cap B^c$.

b) Give examples of a one-one function which is not on-to. Justify your answer.

c) Let F: $\mathbb{R} \to \mathbb{R}$, $f(x) = x + 2$ and g : $\mathbb{R} \to \mathbb{R}$, $g(x) = \cos x$. Find $(fog)(x)$ and $gof(x)$.

d) Let $A = \{x \in \mathbb{R} \mid x^2 + 2x + 1 = 0\}$ and $B = \{x \in \mathbb{R} \mid (x-1)(x+1) = 0\}$. Find $A \times B$.

e) Give an example of a symmetric relation which is not an antisymmetric relation.

Q2) Attempt any four of the following: **[16]**

a) Let $P(x)$ be the statement "student x knows calculus" and let $Q(y)$ be the statement "class y contains a student who knows calculus". Express each of the following as quantifications of $P(x)$ and $Q(y)$:

i) Some students know calculus.

ii) Not every student knows calculus.

b) Show that $\forall x(P(x) \wedge Q(x))$ and $\forall x P(x) \wedge \forall x Q(x)$ are logically equivalent.

P.T.O.

c) Give a proof by contraposition of the theorem "if n is an integer and $3n + 2$ is odd, then n is odd".

d) Show that $\neg(p \vee (\neg p \wedge q))$ and $\neg p \wedge \neg q$ are logically equivalent without using the truth table.

e) Determine whether $(\neg p \wedge (p \rightarrow q)) \rightarrow \neg q$ is a tautology.

Q3) Attempt any four of the following: **[16]**

a) Find all roots of the equation $2x^4 + 4x^3 - 3x^2 - 3x = 0$.

b) Prove that if $a \equiv b(\text{mod } n)$ and $m \mid n$, then $a \equiv b(\text{mod } m)$.

c) Find remainder of $4^{37} + 82$ when divided by 7.

d) Find G.C.D. of polynomials $f(x) = x^3 - 5x^2 + 3x - 15$, $g(x) = x^2 + 3$.

e) Describe all solutions of $3x \equiv 4(\text{mod } 7)$.

Q4) Attempt any four of the following: **[16]**

a) Solve the following system of equations:

$2x - y + 3z = 8$, $-x + 2y + z = 4$, $3x + y - 4z = 0$.

b) Find inverse of the matrix $A = \begin{bmatrix} 1 & 2 & 1 \\ -1 & 0 & 2 \\ 2 & 1 & -3 \end{bmatrix}$

c) If G is a group then prove that identity element in G is unique.

d) Define Transpose of a matrix and symmetric matrix. Give one example of each.

e) Give an example of each of the following:

i) A binary operation which is not associative.

ii) A semigroup which is not a monoid.

iii) A monoid which is not a group.

iv) A group which is not an abelian group.

Q5) Attempt any two of the following: **[16]**

a) Find smallest nonnegative solution of the following system of congruence.

$x \equiv 12 (\text{mod } 31), x \equiv 87 (\text{mod } 127), x \equiv 91 (\text{mod } 255).$

b) Find GCD of 3587, 1819 and express it in linear combinations of 3587 and 1819.

c) Let $\rho = \begin{bmatrix} 1 & 2 & 3 & 4 & 5 & 6 & 7 & 8 & 9 \\ 4 & 5 & 3 & 2 & 1 & 7 & 6 & 9 & 8 \end{bmatrix}$ be a permutation.

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.

v) Find inverse of ρ.

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Total No. of Questions : 5]

SEAT No. :

P1234

[Total No. of Pages : 5

[4638] - 14
M.C. A. - I (Under Science Faculty)
MATHEMATICS
CS - 105: Graph Theory
(2008 Pattern) (Semester - I)

Time : 3 Hours] *[Max. Marks : 80*

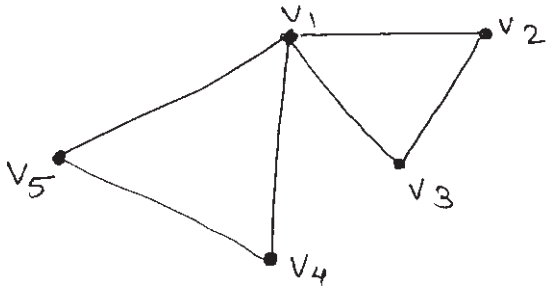
Instructions to the candidates:

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

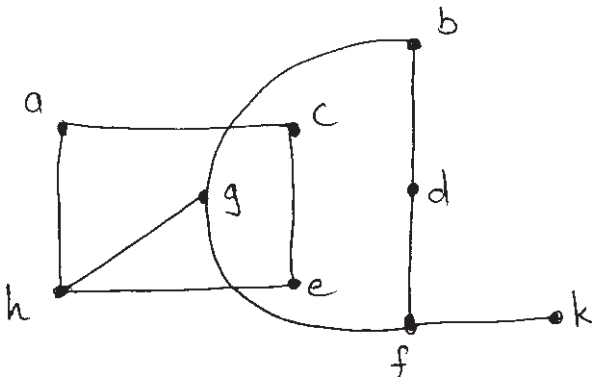
Q1) Attempt each of the following. **[16]**

a) Determine whether the following statement is true or false with justification.Complement of regular graph is regular.

b) Fuse the vertices V_1 & V_2.



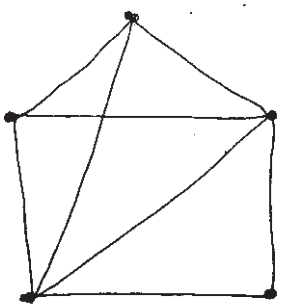
c) Find all bridges and cut vertices in the following graph.



d) Define symmetric diagraph with an example.

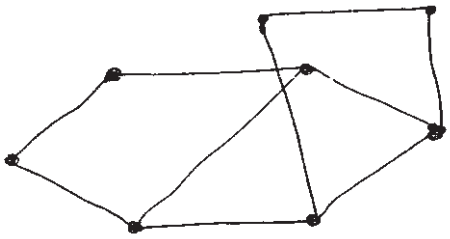
P.T.O.

e) Draw any two spanning trees of the following graph.



f) Draw a binary tree of minimum height on 15 vertices. What is its minimum height?

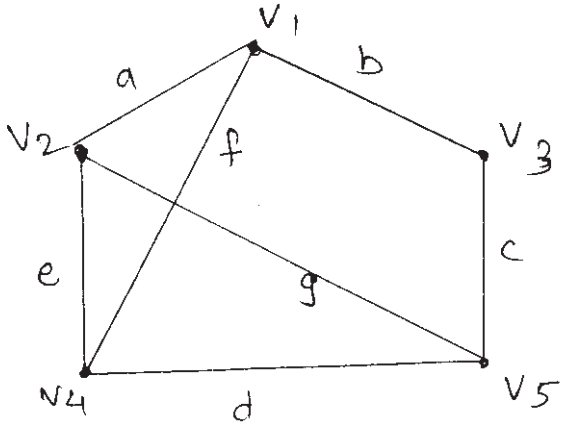
g) Determine whether the following graph is bipartite or not. Justify your answer.



h) Let $a_r = a_{r-1} + 5$ be a recurrence relation with $a_o = 10$. Find a_5.

Q2) Attempt any four of the following: **[16]**

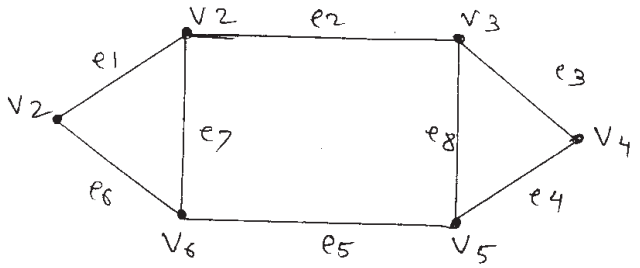
a) Find the incidence and adjacency matrix of the follwing graph.



b) For the following graph G. Find

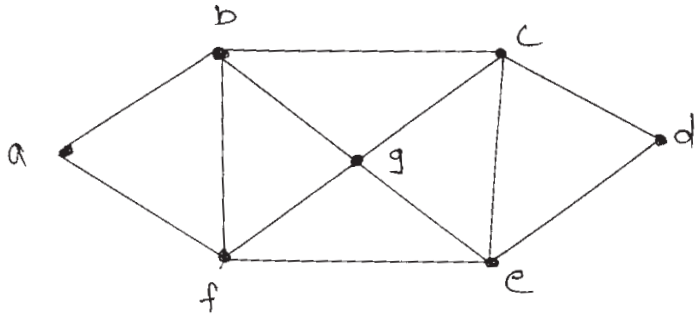
i) induced subgraph G(S) where $S = \{e_2, e_4, e_6, e_8\}$

ii) induced subgraph G(F) where F $=\{v_1, v_2, v_4, v_5\}$

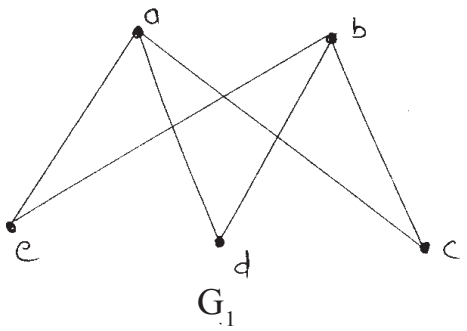


c) Prove that a graph G is connected iff for each pair of distinct vertices u & v there is a u-v path.

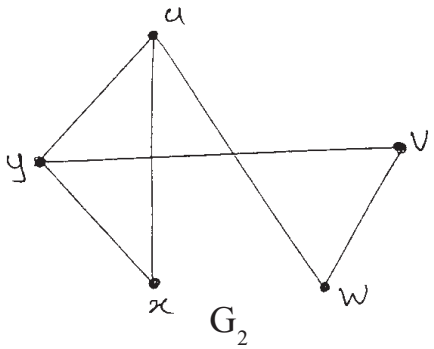
d) Using Fluery's algorithm fine Eulerian Trail in the following graph.



e) Determine whether the following two graphs are isomorphic or not.



G_1

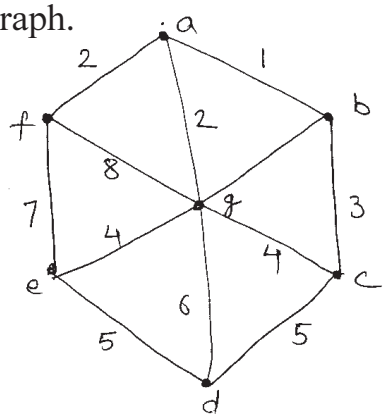


G_2

Q3) Attempt any four of the following: **[16]**

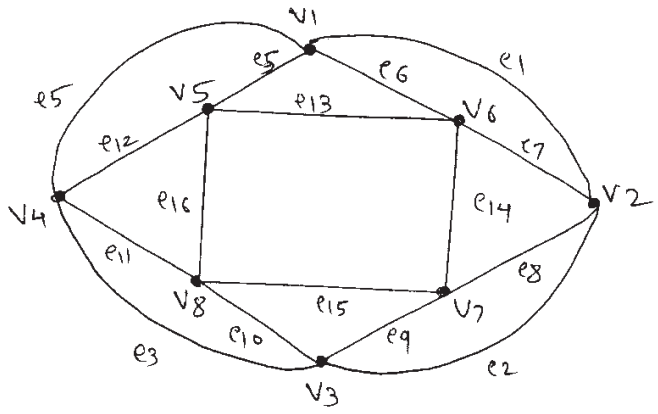
a) Explain travelling salesman problem.

b) Using prim's algorithm find minimal spanning tree of the following weighted connected graph.



c) Solve the following recurrence relation $a_n - 2a_{n-1} - 3a_{n-2} = 0$ with $a_o = 0$, $a_1 = 2$.

d) Find the vertex connectivity and edge connectivity of the following graph.



e) If u and v are any two vertices in a graph G. Then prove that every u-v walk contains a u-v path.

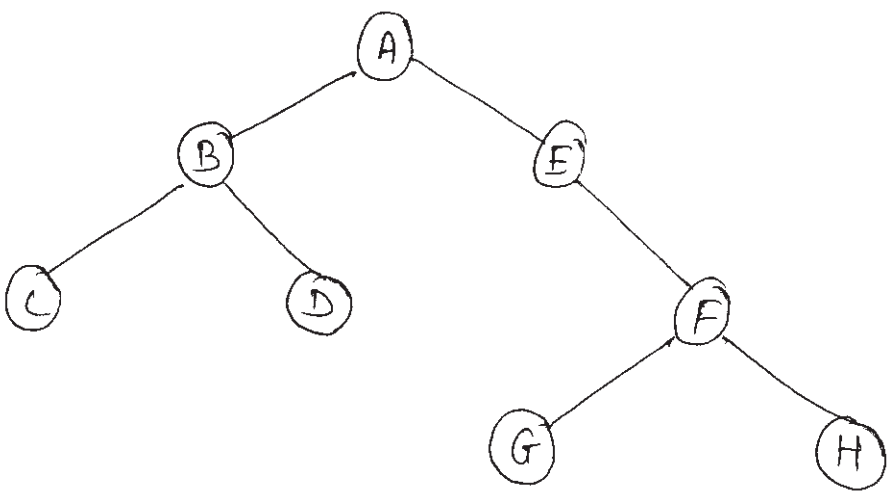
Q4) Attempt any four of the following: **[16]**

a) Give an example of a graph that is Hamiltonian but not Eulerian. Justify.

b) Draw the arborscence for the following expression and write it in polish notation.

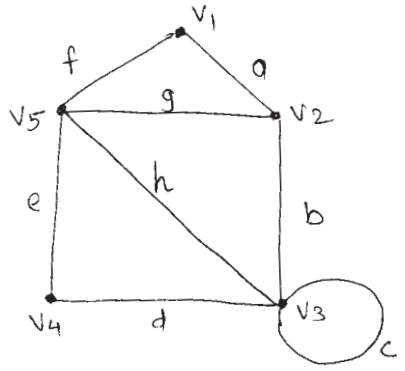
a + (bc)/(d + e - f ↗ c)

c) Obtain preorder and postorder traversal of the following binary tree.

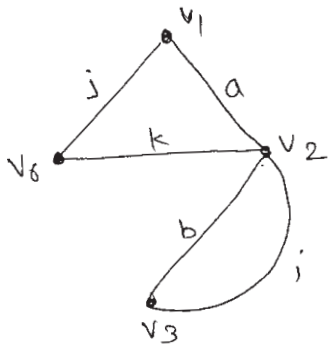


d) Write Breadth First Search algorithm.

e) Find union and ringsum of the following two graphs.



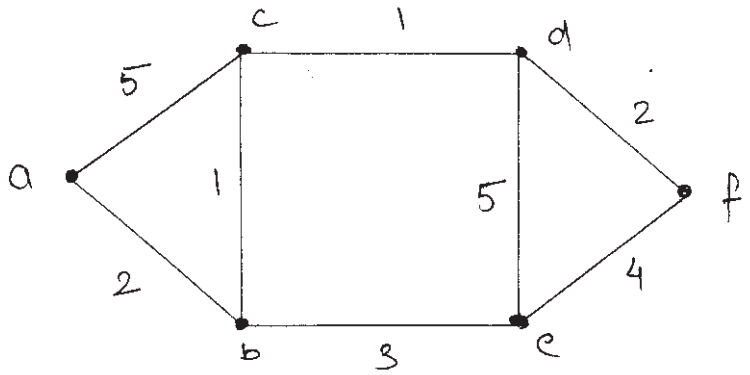
G_1



G_2

Q5) Attempt any two of the following: **[16]**

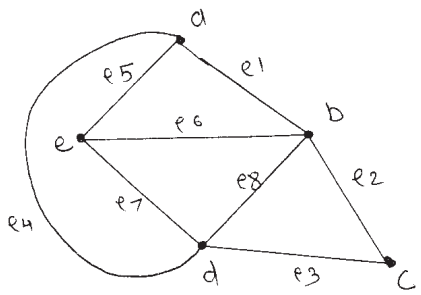
a) Find length of shortest path from vertex a to d using Dijkstra's algorithm.



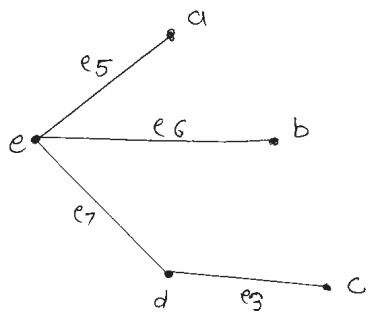
b) Find the total solution of the following recurrence relation

$a_r = a_{r-1} + 2a_{r-2} + 4(3)^r$ with $a_o = 11$, $a_1 = 28$.

c) Find the fundamental circuits and fundamental cutsets of the following graph G w.r. to tree T.



G



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Total No. of Questions :8]

SEAT No. :

P1257

[Total No. of Pages :4

[4638]-202
M.C.A. (Science Faculty)
COMPUTER SCIENCE
CA-202:Theoretical Computer Science
(Semester-II) (2013 Pattern)

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

Instructions to the candidates:

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

Q1) Attempt all:

a) Construct Moore Machine to count the occurrences of substring 'abb' in a string. **[4]**

b) Construct PDA equivalent to the following CFG. **[4]**

$S \rightarrow aAb$

$A \rightarrow aAb \mid B$

$B \rightarrow bB \mid b$

c) Define undecidable problem and Halting problem of Turing Machine. **[2]**

Q2) Attempt all:

a) Construct PDA for L= $\{a^n b^m c^{n+m} \mid n, m \geq 1\}$. **[4]**

b) Prove that regular languages are closed under union. **[4]**

c) Rewrite the following grammar by eliminating unit productions. **[2]**

$S \rightarrow 0Al|lB$

$A \rightarrow 0A|B|0$

$B \rightarrow lA|S|l$

Q3) Attempt all:

a) Construct T.M for L= $\{a^n b^{2n+1} \mid n \geq 0\}$. **[4]**

b) Convert the following grammar into CNF. **[4]**

$S \rightarrow aAbb|AB$

$A \rightarrow bbB|ab|a$

$B \rightarrow bBA|aB|b$

c) Define Equivalence Relation.Give one example. **[2]**

P.T.O

Q4) Attempt all:

a) Construct DFA over {0,1} to accept all string such that-if it starts with '0' must have add number of 1's and if it starts with '1' must have even number of 0's. **[4]**

b) Check whether L=$\{a^n b^n c^n \mid n \geq 1\}$ is context free or not. Justify your answer. **[4]**

c) Rewrite the following grammar by eliminating $\in$ -productions. **[2]**

$S \rightarrow ABA$

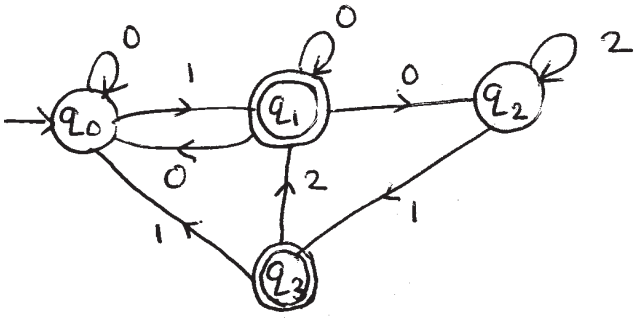
$A \rightarrow aA|\in$

$B \rightarrow bB|\in$

Q5) Attempt all.

a) Construct CFG for L=$\{a^n b^m c^n \mid n \geq 1, m \geq 0\}$. **[4]**

b) Construct DFA equivalent to the following NFA. **[4]**



c) Define prefix and suffix. Give one example of each. **[2]**

Q6) Attempt all.

a) Construct following grammar without useless symbols if any. **[4]**

$S \rightarrow AB|CA$

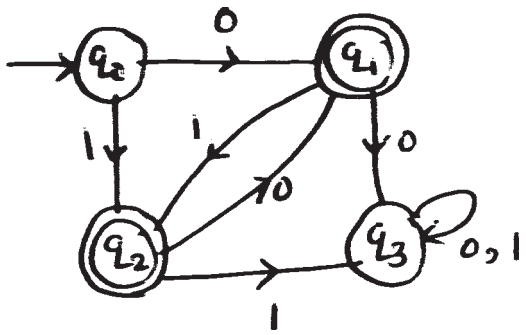
$B \rightarrow BC|AB$

$A \rightarrow aA|a$

$C \rightarrow aB|b$

$D \rightarrow SA|d$

b) Construct Regular Grammar for the following DFA **[4]**

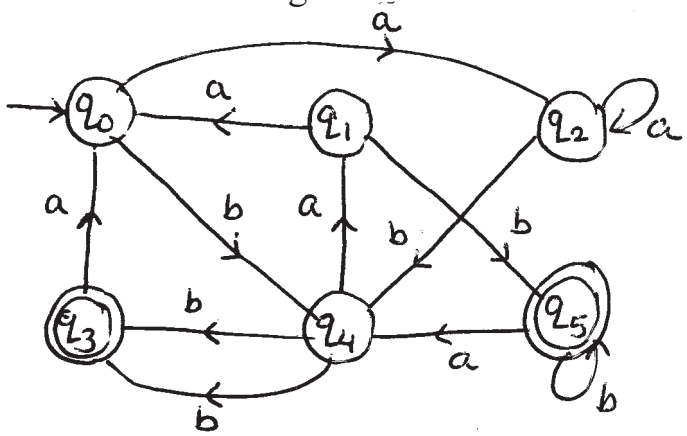


c) Construct FA for regular expression: **[2]**
(a +b)* bb (a +b)*

Q7) Attempt all.

a) Convert the following grammar into GNF. **[5]**
$S \rightarrow 0AB|A1B$
$A \rightarrow S0B|1B|1$
$B \rightarrow A1|0$

b) Minimize the following DFA. **[5]**



Q8) Attempt all.

a) Construct CFG equivalent to the following PDA.
M=$(\{q_0, q_1\},\{0,1\},\{X,R\},\delta,q_0,R,\phi)$ where δ is defined as **[5]**

$\delta(q_0,1,R) = (q_0, XR)$

$\delta(q_0,1,X) = (q_0, XX)$

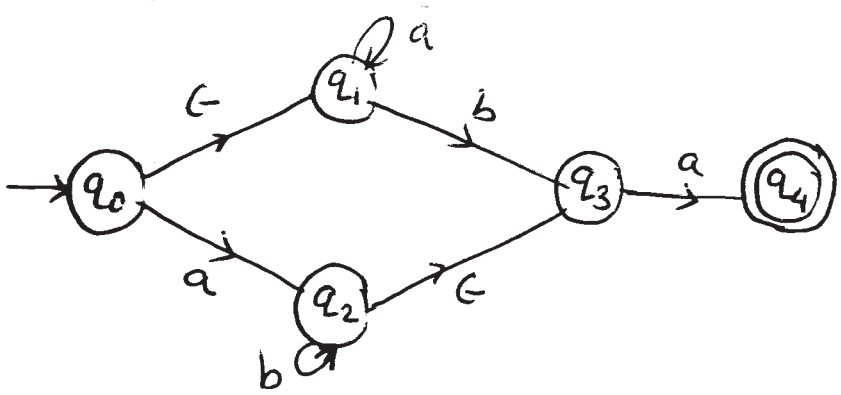
$\delta(q_0,0,X) = (q_1, X)$

$\delta(q_1,\in,R) = (q_0,\in)$

$\delta(q_1,1,X) = (q_1,\in)$

$\delta(q_1,\in,R) = (q_0,R)$

b) Construct DFA for the following NFA. **[5]**



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Total No. of Questions :8]

SEAT No. :

P1258

[Total No. of Pages :3

[4638]-203

M.C.A – I (ScienceFaculty)

CA-203: OBJECT ORIENTED PROGRAMMING (C++ Programming)

(Semester-II) (2013 Pattern)

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

Instructions to the candidates:

1) ***Answer any five questions from the following.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***

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

a) Explain any two inheritance types with example.

b) What is the difference between the following statements?
   i) int * ptr = new int[5];
   ii) int *ptr = new int[5];

c) List features of object oriented programming.

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

a) Explain array of objects with suitable example.

b) What is an inline function? Explain with example. Differentiate between an inline function and macro.

c) Explain access rights in derived class for public, private and protected inheritance.

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

a) What is a friend function? Give syntax to declare a friend function. What are the features of a friend function?

b) What are the characteristics of a virtual function?

c) "Arguments to a constructor can not be assigned default values". State true / false. Justify.

P.T.O

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

a) What is polymorphism? How polymorphism is achieved in C++? Explain any one with example.

b) Explain get ( ) and put ( ) with example.

c) Explain pure virtual function.

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

a) What are different types of constructor? Explain with suitable example.

b) " We can use this pointer with friend function". State true/ false. Justify.

c) What are the limitations of operator overloading?

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

a) Explain with example try, catch and throw.

b) When it is necessary for derived classes to define constructor? Explain with example.

c) Consider class XYZ

```
{     int, a,b;
      public:
      XYZ(int i, int j): a(i), b(2×j) {  }
      void display ( ) {cout << a << "   " << b << "\ n";}
};
main ( )
{     XYZ x (2,3);
      x.display ( );
}
```

what will be the output of the above code?

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

a) Explain overloading of template function with suitable example.

b) Write a C+ + program to merge contents of two files in third file and display contents of third file. Pass name of three files using command line arguments.

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

a) Write a C+ + program to overload binary +, × and / operators for class INTEGER.

b) Explain IOS class functions which are used to format the output.

□□□

Total No. of Questions : 8]

SEAT No. :

P1260

[Total No. of Pages : 3

[4638]-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) ***Answer any five questions from the following.***
2) ***Neat diagrams must be drawn whenever necessary.***
3) ***Figures to the right indicate full marks.***
4) ***Assume suitable data if necessary.***

Q1) Attempt all of the following:

a) Write the differences between OODBMS and ORDBMS. **[4]**

b) State types of Distributed database. Explain any one in detail. **[4]**

c) Define: **[2]**

i) Speed-up

ii) Scale-up

Q2) Attempt all of the following:

a) Explain distributed locking in detail. **[4]**

b) Explain shared memory multiple CPU parallel database architecture. State its advantages. **[4]**

c) Define object Data Management Group (ODMG). **[2]**

Q3) Attempt all of the following:

a) Write a note on Mandatory Access Control. **[4]**

b) State desired properties of Distributed database in detail. **[4]**

c) State the correspondents of hierarchical structure of spatial data model. **[2]**

P.T.O.

Q4) Attempt all of the following:

a) Write a short note on Mobile database. **[4]**

b) State objectives of Distributed database design. **[4]**

c) What is mean by data replication. **[2]**

Q5) Attempt all of the following:

a) Consider the relation: **[4]**

Bill (Bill_no, Amount, due_date, customer_no)

and the set of simple predicates:

{Amount >10,000, due-date < '15-9-14'}.

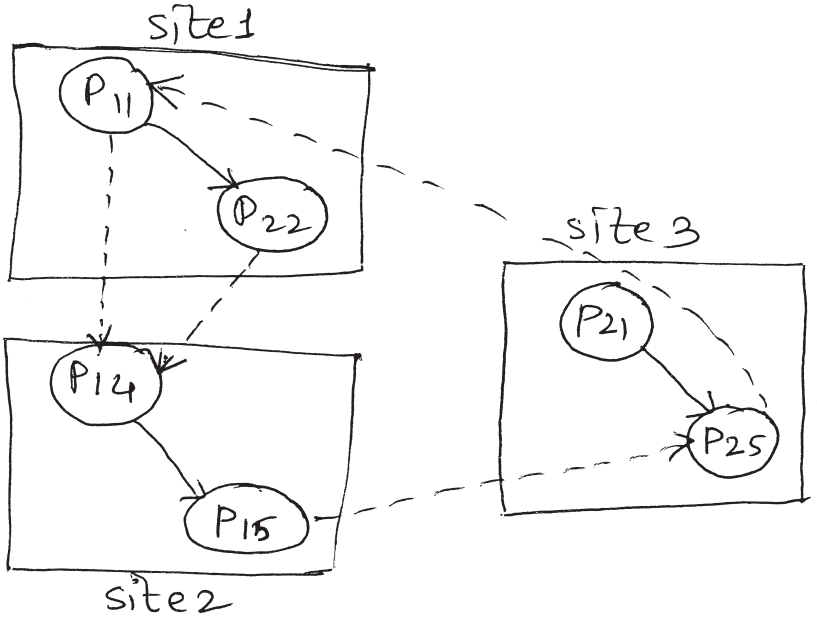
Perform Horizontal fragmentation of above relation.

b) Explain in detail threats to Database Security. **[4]**

c) What is mean by piplined parallelism. **[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 and processes involved in deadlock.

b) Write a note on evolution of data Models. **[4]**

c) State characteristics of Mobile Computing. **[2]**

Q7) Attempt all of the following:

a) Explain advantages and disadvantages of OODBMS in detail. **[5]**

b) Explain Data Encryption in detail. **[5]**

Q8) Attempt all of the following:

a) Write a note on multimedia Databases. **[5]**

b) Explain in detail weakness of RDBMS. **[5]**

Total No. of Questions :5]

SEAT No. :

P1236

[Total No. of Pages :3

[4638]-22

M.C.A – I (ScienceFaculty)

CS-202:THEORETICAL COMPUTER SCIENCE

(Semester-II) (2008 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

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) Attempt any four of the following **[4×4=16]**

a) Prove by induction-

$$\sum_{i=0}^{n} i^2 = \frac{n(n+1)(2n+1)}{6}$$

b) Prove that CFL's are closed under kleene closure.

c) Construct a Turing machine to add two unary numbers.

d) Convert the following CFG, G to equivalent CNF. G=(V,T,P,S) where V={P,Q,R,S}, T={a, b} S is start symbol.

P: $P \rightarrow$ aQRb|QRP, $Q \rightarrow$ Rb|PR.

$R \rightarrow$ a|QRS

$S \rightarrow$ b.

e) Construct NFA for the following:

i) L= { a (a +b)* b}

ii) L= {(0 +1)* 01}.

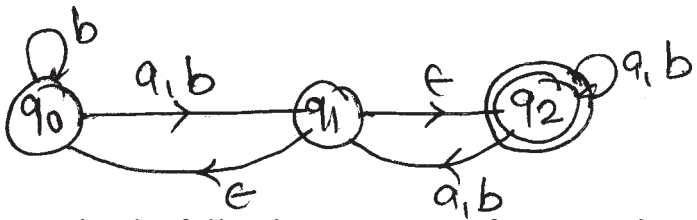
Q2) Attempt any four of the following: **[4×4=16]**

a) Construct FA for the following regular expression.

(a*b*)* + (a* +b)*.

P.T.O

b) Construct DFA equivalent to following DFA.



c) Rewrite the following grammar after removing unit productions.

$S \rightarrow A|bb$

$A \rightarrow B|b$

$B \rightarrow A|bb|a$

d) Write construction steps of PDA from empty stack to final state.

e) Design a turing machine to check well formedness of paranthesis-{(,)}.

Q3) Attempt any <u>four</u> of the following: **[4×4=16]**

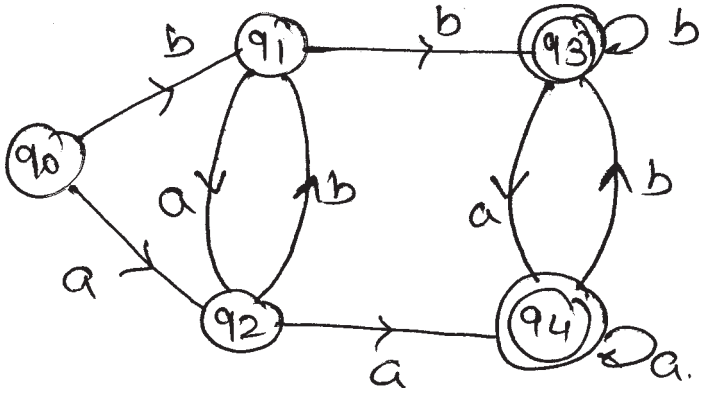
a) Construct PDA for the Language L= $\{a^n b^{2n} c^k \mid k \geq 0, n \geq 1\}$.

b) i) State the rules to eliminate $\in$ productions.

ii) Find R^+ &R* where R={(a,b), (b,c),(c,d), (e,d)}

c) Define non-deterministic turing machine. Explain working of non-deterministic turing machine.

d) Minimize following DFA



e) Construct CFG for the following languages.

i) L=$\{a^n b^n c^i \mid n \geq i \geq 0\}$ ii) L= $\{a^j b^n c^n \mid n \geq j \geq 0\}$

Q4) Attempt any <u>four</u> of the following: **[4×4=16]**

a) Construct turing machine for the language L= $\{a^n b^{2n+2} \mid n \geq 1\}$.

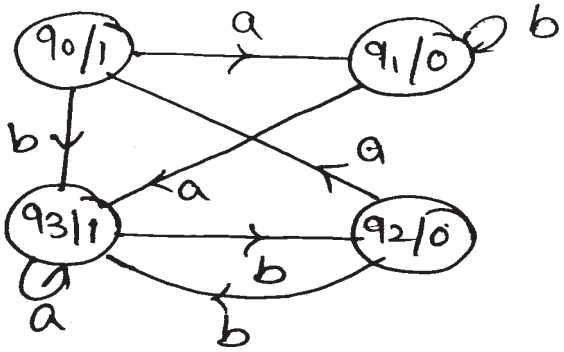
b) Convert the following CFG to equivalent GNF.

$S \rightarrow AaB|a$

$A \rightarrow SBb|bA$

$B \rightarrow Ba|b.$

c) Construct melay machine for the following moore machine.



d) Using pumping lemma check if the language $L=\{o^p|p$ is perfect number$\}$ in regular.

e) Write a short note on Chomsky Hierarchy.

Q5) Attempt any <u>four</u> of the following: **[4×4=16]**

a) Construct PDA to accept strings containing equal number of a's & b's over {a,b}*.

b) Write short note on-construction of composite turing machine.

c) Convert the following CFG to PDA.

$S \rightarrow aAb|aS$

$A \rightarrow Bb|a$

$B \rightarrow Sa|b$

d) Construct DFA to accept a binary number whose decimal equivalent in divisible by3.

e) Construct melay machine such that if it contains substring 'aba' it gives output 'A', if it contains substring 'aab' it gives output 'B' and gives output 'C' otherwise. Over (a +b)*.

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Total No. of Questions : 5]

SEAT No. :

P1237

[Total No. of Pages : 3

[4638]-23

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

CS - 203 :OBJECT ORIENTED PROGRAMMING (C++ PROGRAMMING)

(2008 Pattern) (Semester - II)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All Questions are compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***All questions carry equal marks.***

Q1) Attempt all of the following: **[8 × 2 = 16]**

a) Explain the following terms:

i) Data hiding

ii) Polymorphism.

b) Give any uses of "void".

c) What is the meaning of the following statements:

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

ii) int * p = new int ;

d) What is an inline function? Also compare it with macro.

e) Differentiate between a structure and a class in C++.

f) Give general form of an operator function. Also give one example.

g) What are the limitations of an operator overloading?

h) How to define a pure virtual function? What is the purpose of it?

P.T.O.

Q2) Attempt any four of the following: **[4 × 4 = 16]**

a) What is a friend function? What are its characteristics and disadvantages?

b) What is this pointer? When is it necessary to use this pointer? Explain with suitable example.

c) Explain the runtime polymorphism with example.

d) Write a C++ program to accept name and roll_no of a student. Raise an exception if negative roll_no is entered by user. Also raise an exception if name contains any digit.

e) Explain any four manipulators with example.

Q3) Attempt any two of the following: **[2 × 8 = 16]**

a) Consider a class loc(integer longitude and latitude). Define appropriate construction and display ( ) function for above class.

Overload following operators:

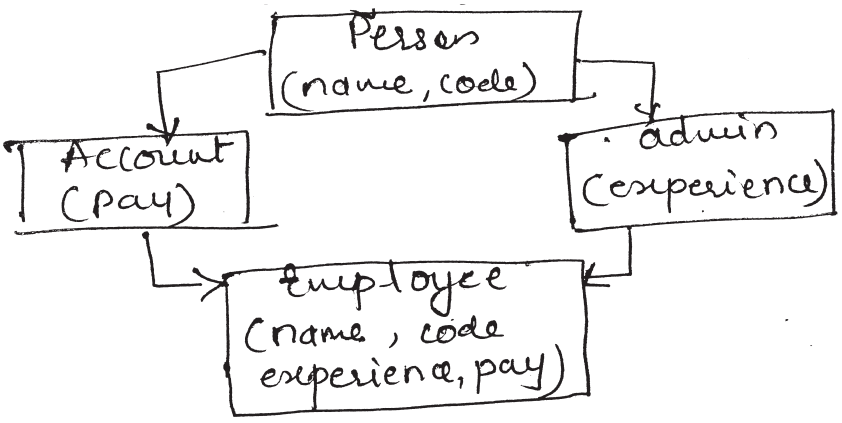
i) – =shorthand operator eg. a1 – = a2;

ii) + Binary addition eg. a2 = a1 + 3;

iii) + Binary addition eg. a2 = 3 + a1;

b) Write a C++ program to read a file which contains alphabets. Also display the count of vowels and consonents from the file.

c) 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.

Q4) Attempt any four of the following: **[4 × 4 = 16]**

a) Write a short note on an allocator.

b) Explain static data members and member functions with suitable example.

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

d) Write a C++ program with employee (eno, name) and project (pno, pname) and derive a class emp_proj (duration_in_days). Define accept ( ) and display ( ) function in each class. Also store information of 'n' emp_proj objects & display it.

e) Explain class template with multiple parameters with suitable example.

Q5) Attempt any four of the following: **[4 × 4 = 16]**

a) Explain error handling functions for files in C++.

b) Explain private and protected access specifier with example.

c) Explain hierarchical inheritance with example.

d) Explain width ( ) and precision ( ) ios functions with example.

e) What will be the output of the following code segment and also explain it.

```
Class A
{     public : A( )
              {cout <<"\n obj created"; }
              ~A ( )
              {cout << "\n obj destroyed";}
};
A a1;
main ( )
{     A a2;
      {A a3;}
      exit(0);
}
```

Total No. of Questions : 8]

SEAT No. :

P1261

[Total No. of Pages : 4

[4638]-301
M.C.A. (Science Faculty)
C - 301 : DESIGN AND ANALYSIS OF ALGORITHM
(2013 Pattern) (Semester-III)

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

Instructions to the candidates:

1) ***Solve any five from the following.***
2) ***Figures to the right indicate full marks.***
3) ***Neat diagrams must be drawn wherever necessary.***

Q1) Attempt all of the following:

a) Write the Horner's Rule for polynomial evaluation and it's pseudocode. **[4]**

b) Solve following instance of 0/1 knapsack using LCBB with fixed tuple

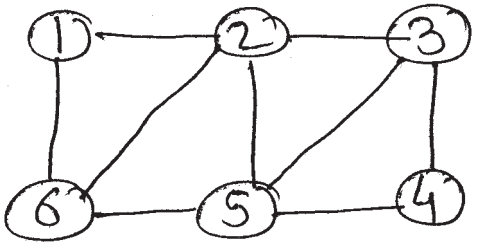
M = 10 P = (8, 5, 5) W = (6, 5, 5) **[4]**

c) Define Asymptotic Notations. **[2]**

Q2) Attempt all of the following:

a) Explain the various techniques for representing graphs with example. **[4]**

b) Find all possible Hamiltonian cycles for following graph. **[4]**



c) Show that $O(n!) \neq O(n^m)$ **[2]**

Q3) Attempt all of the following:

a) Explain FFT (Fast Fourier Transform). **[4]**

Evaluation in detail.

P.T.O.

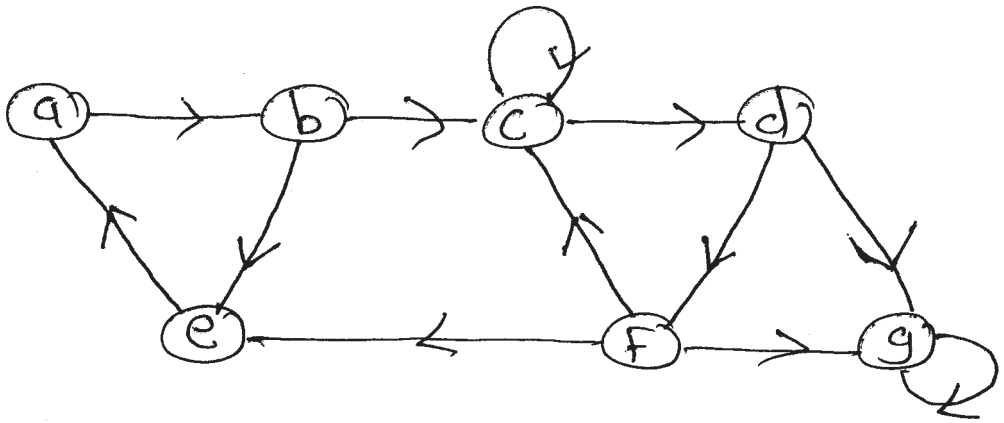
b) Consider the following travelling salesman instance defined by cost matrix, obtain the reduced cost matrix. Draw state space tree using LCBB. **[4]**

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

c) Define space complexity and Time complexity of an Algorithms. **[2]**

Q4) Attempt all of the following:

a) Find the strongly connected components of given graph G. **[4]**



b) Find out the solution for sum of subsets using variable tuple size state spacetree n = 5 m = 30 w = (5, 20, 10, 15, 5). **[4]**

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

$$A = \begin{bmatrix} 5 & 3 \\ 7 & 2 \end{bmatrix} \qquad B = \begin{bmatrix} 7 & 8 \\ 4 & 6 \end{bmatrix}$$ **[2]**

Q5) Attempt all of the following:

a) Apply Floyd warshall algorithm to find lengths of shortest path from vertex u to vertex V where adjancency matrix of G is

$$W = \begin{bmatrix} 0 & 4 & 11 \\ 6 & 0 & 2 \\ 3 & \infty & 0 \end{bmatrix}$$ **[4]**

b) Sort the given data using Quick sort 57, 85, 24, 45, 17, 31, 96, 50, 65. **[4]**

c) Find the optimal merge pattern for merging the file of size 10, 5, 7, 20, 12. **[2]**

Q6) Attempt all of the following:

a) Find an optimal paranthesization of a matrix-chain product whose sequence of dimensions is {30, 35, 15, 5, 10, 20, 25}. **[4]**

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

n = 7

p = (3, 5, 20, 18, 1, 6, 30)

d = (1, 2, 4, 3, 2, 1, 2)

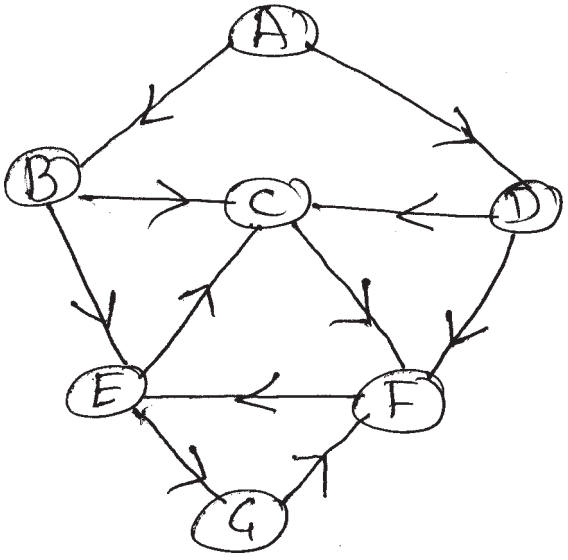
c) Define NP-Hard and NP-Complete. **[2]**

Q7) Attempt all of the following:

a) Solve Travelling Sales Person problem (TSP) using Dynamic programming for the graph 'G' by adjacency matrix A. **[5]**

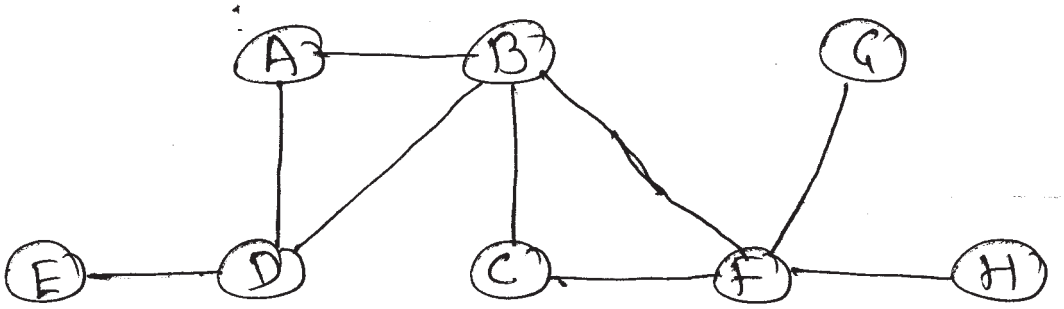
$$\begin{bmatrix} 0 & 8 & 13 & 18 & 20 \\ 3 & 0 & 7 & 8 & 10 \\ 4 & 11 & 0 & 10 & 7 \\ 6 & 6 & 7 & 0 & 11 \\ 10 & 6 & 2 & 1 & 0 \end{bmatrix}.$$

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



Q8) Attempt all of the following:

a) Find articulation point and Bj-connected component for the following graph 'G'. **[5]**



b) Solve the following 0/1 knapsack problem using dynamic programming.

n = 4 m = 18 w = {3, 8, 6, 4}

p = {9, 10, 12, 9}. **[5]**

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Total No. of Questions :8]

SEAT No. :

P1263

[Total No. of Pages :2

[4638]-303
M.C.A. (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 the spiral model. **[4]**

b) What are the different types of maintenance? Explain. **[4]**

c) List various types of system. **[2]**

Q2) Attempt the following:

a) Explain the concept of cohesion & types of cohesion. **[4]**

b) Write a note questionaries. **[4]**

c) Define Re-engineering. **[2]**

Q3) Attempt the following:

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

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

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

Q4) Attempt the following:

a) Which are the processes of project risk management? Explain any one in detail. **[4]**

b) Draw diagram of SDLC model. Explain in brief. **[4]**

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

P.T.O.

Q5) Attempt the following:

a) Discuss the key element of the project management knowledge areas. **[4]**

b) Explain various stages of system testing. **[4]**

c) What is requirement investigation? **[2]**

Q6) Attempt the following:

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

b) Why project control is important? Explain objective of project control. **[4]**

c) What are software crisis. **[2]**

Q7) Attempt the following:

a) Draw a structure chart for "Reservation cancellation" module of Railway reservation system. **[5]**

b) Write a short note on - Black Box testing. **[5]**

Q8) Attempt the following:

a) A manufacturing company of various varieties of Ball pens. The company has decided to computerize their purchase order system following procedure is followed in the company. After receiving the purchase requisition from store department, enquiries are made to various suppliers. The supplier sent quotations to company. All questioner analyst and final section of suppliers is made and accordingly purchase order to respective suppliers are sent. The suppliers send invoice along with raw material. The requirements of the company are as follows. Maintains suppliers, Raw material, quotation and purchase order Database. Generate quotation Analysis Report generate purchase order, pending order details generate various MIS reports such as item - wise, supplier - wise reports. Find out the Entities, Draw context level, first level DFD. **[5]**

b) What is Data Dictionary? Discuss the advantages of Data Dictionary. **[5]**

EEE

Total No. of Questions :8]

SEAT No. :

P1264

[Total No. of Pages :2

[4638]-304
M.C.A. (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 diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Attempt all of the following:

a) Explain access specifiers used in Java. **[4]**

b) Explain delegation event model. **[4]**

c) State the use of javap and javadoc tools. **[2]**

Q2) Attempt all of the following:

a) Write a java program to display sum of following series.

$1^2 + 3^2 + 5^2 + 7^2 + ...$ **[4]**

b) Write a program that reads a file containing student name and percentage. Display the contents of the file. Also display particular record of a file. (Use Random Access file). **[4]**

c) Differentiate between applets & Application. **[2]**

Q3) Attempt all of the following:

a) Write a note on Anonymous Inner classes. **[4]**

b) Explain any four methods of stringTokenizer class with example. **[4]**

c) Differentiate between streamReader and stream writer. **[2]**

Q4) Attempt all of the following:

a) Write a java program to accept two strings as command line arguments & perform the following operations. **[4]**

i) Check if the second string is present in the first string.

ii) Compare the strings.

P.T.O.

b) Explain the importance of packages. How user-defined packages are created & used in java? **[4]**

c) What are the advantages of layout manager in AWT? **[2]**

Q5) Attempt all of the following:

a) Write a program to display calculator with basic arithmetic operations (+, –, x, /) using awt & event handling. **[4]**

b) Define two ways to creates threads in java. **[4]**

c) Explain printwriter class. **[2]**

Q6) Attempt all of the following:

a) Write a program to accept number using textfield with the help of two radio buttons it will display factorial of a given number orbinary equivalent of given number. (Use awt & event handling). **[4]**

b) Explain synchronization of threads with suitable example. **[4]**

c) What is use of break & continue? **[2]**

Q7) Attempt all of the following:

a) Write a java program to find addition of all elements of an array and check for array limit (Use exception handling) **[5]**

b) Explain model view controller Architecture for swing. **[5]**

Q8) Attempt all of the following:

a) Explain the use of J Filechooser, JTable, JDialog, JTree and JProgress bar. **[5]**

b) Create an abstract class employee. Derive two classes manager & worker from it. Use proper method to accept & display the details for the same. The fields of manager are manager name & department. similar fields for worker are name & working hours. **[5]**

EEE

Total No. of Questions : 8]

SEAT No. :

P1265

[Total No. of Pages : 3

[4638] - 305
M.C.A. (Science Faculty)
CA- 307:NUMERICAL METHODS
(2013 Pattern) (Semester - III)

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

Instructions to the candidates:

1) ***Attempt any five questions.***
2) ***All questions carry equal marks.***
3) ***Use of Scientific, nonprogrammable calculator is allowed.***
4) ***Figures to the right indicate full marks.***

Q1) All questions are compulsory.

a) Find cube root of 25 corrected up to 3 decimal places by false position method. **[4]**

b) Prove that $\frac{\Delta}{\nabla} - \frac{\nabla}{\Delta} = \mathrm{E} - \mathrm{E}^{-1}$. **[4]**

c) Define the term with appropriate formula ‘‘Percentage error’’. **[2]**

Q2) All questions are compulsory.

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

b) Estimate the missing term of following data **[4]**

x	0	1	2	3	4
y	-1	0	---	26	63

c) State Lagranges interpolation formula for ‘n’ Intervals (proof not expected). **[2]**

P.T.O.

Q3) All questions are compulsory.

a) Find $f(4.4)$ from the following data. **[4]**

x	0	2	4	6	8	10
$f(x)$	12	7	6	7	13	32

b) Given that $\frac{dy}{dx} = x^2 + y;\ y(0) = 1$, find $y(0.1)$ using Eulers method (take $h = 0.05$). **[4]**

c) The value of $\sqrt{2}$ = 1.414214, if it's approximate value is taken as 1.414, find the relative error. **[2]**

Q4) All questions are compulsory.

a) Find a polynomial $f(x)$ for the following data. Also find $f(2)$. **[4]**

x	0	1	3	4
$f(x)$	-12	0	6	12

b) If $f(1) = 10, f(2) = 50, f(3) = 70, f(4) = 80, f(5) = 100$, find $\int_1^5 f(x)\,dx$ using Trapezoidal rule. **[4]**

c) Locate the error and correct if of the following table. **[2]**

x	1	2	3	4	5	6	7
y	2	5	10	18	26	37	50

Q5) All questions are compulsory.

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

b) Using Runge-Kutta method of fourth order, evaluate $y(0.2)$ where $\frac{dy}{dx} = x^2 + y^2$ with $y(0) = 0$, take $h = 0.2$. **[4]**

c) Find the polynomial $f(x)$ using Lagranges interpolation formula. **[2]**

x	0	1	4
y	1	-1	1

Q6) All questions are compulsory.

a) Prove that n^{th} difference of n degree polynomial is constant. **[4]**

b) Using Euler's modified method, solve $\frac{dy}{dx} = x + y$ with initial condition $y_0 = 1$, find $y(0.1)$, take $h = 0.1$. **[4]**

c) Differentiate between Simpson's 1/3 rule and Simpson's 3/8 rule. **[2]**

Q7) All questions are compulsory.

a) Represent the function $x^4 - 12x^3 + 42x^2 - 30x + 9$ and it's successive differences in factorial notation. **[5]**

b) Use backward formula to find the population of the year 1936 from the data given below. **[5]**

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

Q8) All questions are compulsory.

a) Derive Newton's forward interpolation formula. **[5]**

b) Find the value of y at $x = 2.65$ from the following data. **[5]**

x	-1	0	1	2	3
y	-21	6	15	12	3

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Total No. of Questions : 8]

SEAT No. :

P1266

[Total No. of Pages : 2

[4638] - 306
M.C.A. (Under Science)
CA - 308: MULTIMEDIA SYSTEM
(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) Solve the following.

a) Explain Hytime. **[4]**

b) Explain Digital Representation of sound. **[4]**

c) List any four format of images. **[2]**

Q2) Solve the following.

a) Explain MHEG (Multimedia & hypermedia Expert Group). **[4]**

b) Explain uses of Audio in computer Application. **[4]**

c) Explain Inter object synchronization. **[2]**

Q3) Solve the following.

a) Explain transmission of digital sound. **[4]**

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

c) Define Inter personnel communication. **[2]**

Q4) Solve the following.

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

b) Explain goals of Multimedia system services. **[4]**

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

P.T.O.

Q5) Answer the following.

a) Explain Time & Multimedia Requirement. **[4]**

b) Explain Adaptive and linear predictive coding. **[4]**

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

Q6) Answer the following.

a) Explain lossless and lossy compression. **[4]**

b) Explain static and dynamic Haffman coding. **[4]**

c) Enlist two difference between JPEG and MPEG. **[2]**

Q7) Answer the following.

a) Explain QMF file format. **[5]**

b) Explain the issues that should be considered while designing a presentation. **[5]**

Q8) Answer the following.

a) Explain Entertainment Application and Multimedia conferencing. **[5]**

b) Explain Embedded Domain system Design. **[5]**

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Total No. of Questions : 8]

SEAT No. :

P1267

[Total No. of Pages : 2

[4638] - 307
M.C.A. (Science Faculty)
COMPUTER SCIENCE
CA - 309: Dot Net
(2013 Pattern) (Semester - III)

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

Instructions to the candidates:

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

Q1) a) Explain working of CLR in detail. **[4]**

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

c) Explain virtual function with example. **[2]**

Q2) a) Write a C# program to calculate square root of a number. Throw 'Negative NumberException', if the number is negative. (Accept the number from user). **[4]**

b) What is assembly? Differentiate between private and shared assembly. **[4]**

c) Explain any two dialog boxes with methods and events. **[2]**

Q3) a) What is Reflection? Explain methods of System. Type class. **[4]**

b) What is synchronization? How thread synchronization is implemented in C#? **[4]**

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

Q4) a) List and explain access modifiers in C#. **[4]**

b) Explain the purpose of finally block. **[2]**

c) Explain disconnected architecture of ADO.NET. **[4]**

P.T.O.

Q5) a) Explain any four methods and four events of Form class. **[4]**

b) Write a program to check if a string is palindrome or not using collection class. **[4]**

c) What is boxing and unboxing. **[2]**

Q6) a) Explain how web server controls are used in ASP.NET. **[4]**

b) What are delegates? Explain Unicast delegates with example. **[4]**

c) State the purpose of Execute Scalar and Execute NonQuery methods. **[2]**

Q7) a) How parameters can be passed to a method? Explain with an example. **[5]**

b) What is the use of IIS in ASP.NET? Explain Postback and ViewState. **[5]**

Q8) a) Write a C# program to read a directory name from the user and list all the contents of it. Delete all files with extension ".html" and display the contents of the directory. **[5]**

b) Define Session and Application Variable/Object. Explain session state management using SQL server. **[5]**

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Total No. of Questions : 4]

SEAT No. :

P1239

[Total No. of Pages : 4

[4638]-31
M.C.A. (Under Science Faculty)
COMPUTER SCIENCE
CS - 301 : Design and Analysis of Algorithm
(2008 Pattern) (Semester-III)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Neat diagrams must be drawn wherever necessary.***
2) ***Figures to the right indicate full marks.***
3) ***Assume suitable data if necessary.***
4) ***All questions are compulsory.***

Q1) Attempt All: **[8 x 2 = 16]**

a) Explain Big-oh (θ) & omega (Ω) Notation to denote complexities.

b) Discuss the time complexity of Heapsort in the Best-case, Worst-case and average case.

c) Define P-class and NP-class problem.

d) State principle of obtimality.

e) Explain maximum Bipattite matching problem.

f) Space complexity is independent of instance characteristics. Justify.

g) What are strongly connected components.

h) Partial solution obtain during kruskal algorithm are also tree. Justify.

Q2) Attempt Any Four: **[4 x 5 = 20]**

a) Consider 011 knapsack problem with

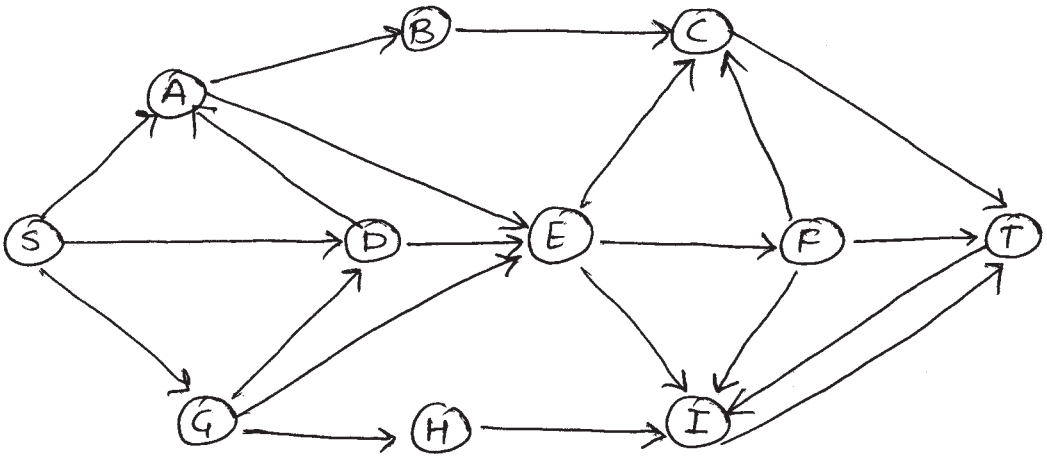
n=4 m=21 p=(13, 11, 12, 15)

w=(6, 5, 7, 8)

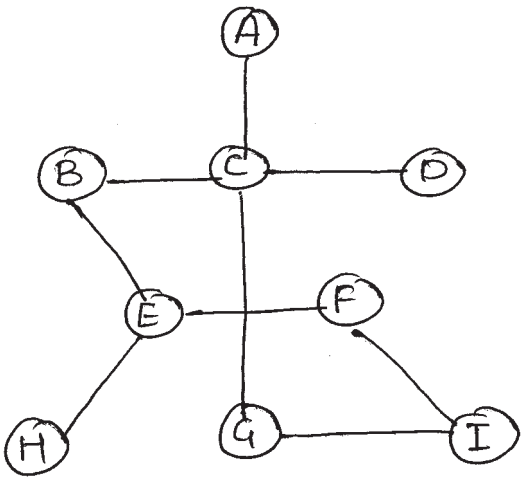
Using dynamic programming.

P.T.O.

b) Obtain Topological sort for the following graph.



c) Illustrate all stages of DFS and BFS on the graph at the vertex (starting) F.



d) What is an optimal Huffman code for the following set of frequencies.

Character	A	B	C	D	E	F	G
Frequency	10	30	5	15	20	15	5

e) Write Merge sort algorithm and obtain it's Best case and worst case running time.

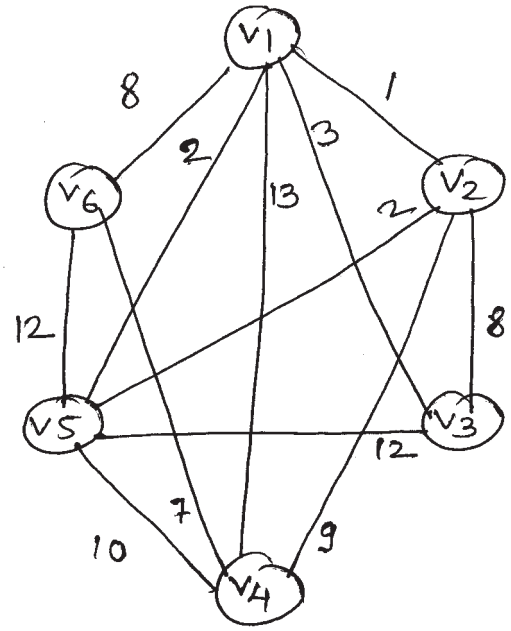
Q3) Attempt Any Four: **[4 x 8 = 32]**

a) Consider following 0/1 knapsack LCBB instance where $n = 4$ $m = 15$

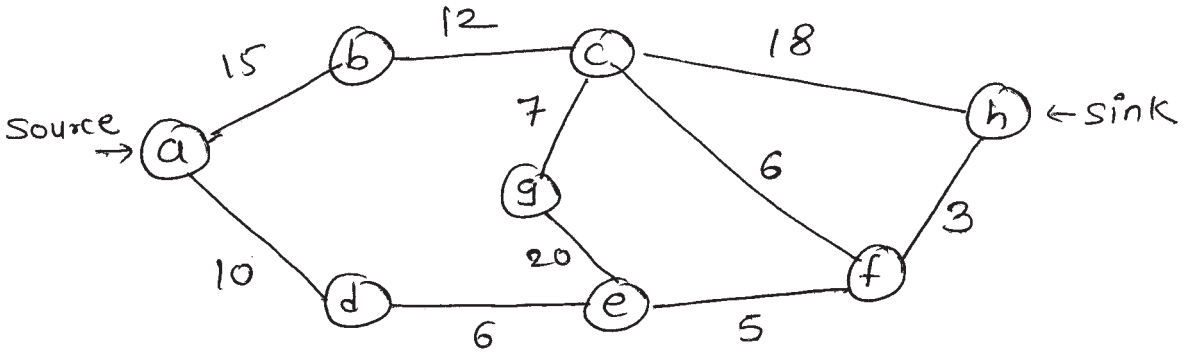
$p = (10, 10, 12, 18)$

$w = (2, 4, 6, 9)$

b) Using Prim's and Kruskal's algorithm find minimum cost and minimum spanning tree for following graph 'G'.



c) Explain Dijkstra's Algorithm. Apply the algorithm on the graph given below.



d) Consider travelling sales person instance defined by cost matrix.

$$\begin{bmatrix} \infty & 7 & 3 & 12 & 8 \\ 3 & \infty & 6 & 14 & 9 \\ 5 & 8 & \infty & 6 & 18 \\ 9 & 3 & 5 & 8 & 11 \\ 16 & 14 & 9 & 3 & \infty \end{bmatrix}.$$

e) Find out solution for sum of subsets using fixed tuple size and variable tuple size state space tree.

Where n=7 m=35

w=(5, 7, 10, 12, 15, 18, 20).

Q4) Attempt Any Three: **[3 x 4 = 12]**

a) Find an optimal solution to the knapsack problem instance knapsack problem using greedy method

n=6 w=(6, 7, 11, 12, 9, 5)

m=30 p=(13, 16, 23, 19, 12, 13)

b) Use strassen's algorithm to compute the matrix product of the following matrix giving each computational step.

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

c) Explain string editing problem. Give the recurrence relation for the value of the optimal solution when the problem is to be solved using Dynamic programming.

d) Explain 8 Queen problem and give the formulation for explicit and implicit constraints in case of 8 Queen's problem.

e) Let n=5 p=(20, 15, 10, 5, 1) and d=(2, 2, 1, 3, 3). Find optimal solution for above instance of job sequencing with deadlines.

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Total No. of Questions :5]

SEAT No. :

P1241

[Total No. of Pages :4

[4638]-33

M.C.A. (Science Faculty)

CS-303: SYSTEM PROGRAMMING AND OPERATING SYSTEM

(2008 Pattern) (Semester - III)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicate full marks.***

Q1) Attempt all of the following: **[8x2=16]**

a) What is multithreading?

b) State any two differences between logical address and physical address.

c) Explain:

i) Throughput

ii) Turnaround time

d) What is segmentation?

e) What is a page fault?

f) When is a system in safe state?

g) What is an interrupt?

h) Explain exec ( ) system call.

Q2) Attempt any four: **[4x4=16]**

a) Explain spooling and buffering.

b) Explain linked file allocation method.

c) What are necessary conditions for a deadlock to occur?

d) What is paging? Explain with suitable example.

e) What is deadlock avoidance and deadlock prevention? How they differ from each other?

P.T.O.

Q3) Attempt any four: **[4x4=16]**

a) Consider the following status of the system. All jobs arrive at time 0

Job	Burst time	Priority
A	8	2
B	4	1
C	5	4
D	2	2
E	1	3

Draw Gantt chart using -

i) RR (Quantum = 4)

ii) non preemptive priority.

(a smaller priority number implies a higher priority)

b) Consider the following reference string.

2, 3, 4, 5, 3, 2, 6, 7, 3, 2, 3, 4, 1, 7, 1, 4, 3, 2, 3, 4, 7.

Calculate no. of page faults using

i) LFU

ii) MFU

Page frames =3

c) Suppose the head moving disk with 200 tracks (0-199) is currently at track 53. If requests in queue are 98, 183, 37, 122, 14, 124, 65, 67.

What are the total head movements using following algorithm.

i) Look

ii) C - Look

d) Consider the following snapshot of a system. Execute Banker's algorithm.

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

i) Is the system in safe state?

ii) If a request from process P1 arrives (1, 4, 2, 0) can the request be granted?

e) What are the physical addresses for the following logical addresses?

i) 0, 430

ii) 1, 10

iii) 2, 500

iv) 3, 400

Q4) Attempt any four: **[4x4=16]**

a) What is critical section ?

b) Explain in brief techniques of memory allocation.

c) 'A safe state is not a deadlock, but a deadlock state is an unsafe state'. Explain.

d) What is a thread? Explain the differences between process and thread.

e) Explain how a directory is implemented as a linear list and hash table.

Q5) Attempt any four: **[4x4=16]**

a) How do you choose a optimal technique among the various disk scheduling techniques?

b) Explain:

i) Virtual memory

ii) Process state.

c) Explain segmention in brief.

d) Compare and contrast different memory allocation methods - First fit, Best fit and worst fit.

e) Write a note on multilevel queue scheduling.

EEE

Total No. of Questions : 5]

SEAT No. :

P1242

[Total No. of Pages : 3

[4638] - 34
M.C.A. (Under Science Faculty)
COMPUTER SCIENCE
CS-305: Event Driven Programming (Win 32 SDK)
(2008 Pattern) (Semester - III)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All Questions are compulsory.***
2) ***Assume Suitable data, if necessary.***
3) ***WinMain not needed.***
4) ***Figure to the right indicate full marks.***

Q1) Case study. **[12]**

Write a complete Win 32 SDK program that is menu driven having following menu items and supporting given functionality.

-List: Displays in a list box, names of all football teams. On clicking with mouse to select a team, team members are displayed on the right side of the client area.

-Accept: Opens a dialog box to accept team info details. The record gets inserted into the database when OK button on the dialog box is clicked.

Q2) Write program statements using Win32 APIs for any four of the following. **[4×5 = 20]**

a) Display "L-Button clicked" in the client area where you click the left button and then erase everything on a right button click.

b) To create a metafile for drawing a smiley face and displaying smiley face at the center of the client area.

c) Display Horizontal scrollbar and handle thumb event.

P.T.O.

d) Draw two ellipse of the same size one at the top half and the other in the lower half.

e) Create an Edit box and a button, on click of the button; display text in Upper Case entered in the edit box with the help of a message box.

Q3) Answer in brief : any eight. **[8×2 = 16]**

a) How will you make "hButton" (HWND) visible on screen and hide it?

b) Give the syntax of function for Creating and Painting regions.

c) What is the sequence of the message generated when the user presses shift 'A'?

d) List the different mouse messages generated in client area.

e) How will you create a button using Create Window function?

f) What are the contents of wParam and IParam for mouse messages?

g) What all methods will return a Device context (DC)?

h) How to associate a DlgProc to a Dialog box?

i) On the click of Left button, from where will you extract the coordinates?

Q4) Justify True/False (Any six). **[6×2 = 12]**

a) WndProc is a reentrant.

b) Any menu that is attached to a window is automatically destroyed when the window is destroyed.

c) VK_SHIFT is a virtual key code.

d) The InvalidateRect function removes a rectangle to the windows region.

e) Notepad is not a example of SDI application.

f) WM_TIMER is a queued message.

g) After calling create caret, there is no need to call show caret.

Q5) Attempt any four. **[4×5 = 20]**

a) Explain SDI and MDI.

b) List the various button styles provided by windows. Explain any two.

c) What is Thread? Explain critical section.

d) Write a difference between Win32 and Dos.

e) Which are different windows resources? Explain any one.

f) Write note on WM-TIMER.

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Total No. of Questions : 5]

SEAT No. :

P1243

[Total No. of Pages : 3

[4638] - 41

M.C.A. (Under Science Faculty)

CS-401: INTRODUCTION TO UNIX AND UNIX INTERNALS

(2008 Pattern) (Semester - IV)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt all of the following: **[8×2 = 16]**

a) What is tie-breaker rule?

b) What is region? List three types of regions.

c) Explain syntax and usage of kill system call.

d) List any four fields of disk inode.

e) Explain syntax and usage of unlink ( ) system call.

f) What is context of a process?

g) What is callout table?

h) What is uarea? List its fields.

Q2) State true or false. Justify your answer (any four). **[4×4 = 16]**

a) In the link system call, the kernel must release the source file's inode, after incrementing its link count.

b) If a process is waiting to write named pipe and there are no more reader processes, there will never be a reader process.

c) Once the execution of process starts its size cannot be changed dynamically.

d) Zombie processes are never swapped.

e) 'Exec' and 'fork' system calls are similar.

Q3) Attempt any four of the following: **[4×4 = 16]**

a) Explain any two time related system calls with example.

b) Explain how inode it assigned to a new file.

P.T.O.

c) Explain structure of buffer pool.

d) Explain four cases for reading and writing from the pipe.

e) Explain the logical format of executable file.

Q4) Attempt any four of the following: **[4×4 = 16]**

a) Explain the behaviour of the following program.

```
main ( )
{
int child;
if ( ( child = fork ( ) = = 0)
{
print f(“child PID % d \n”, get pid ( ) );
pause ( );
}
/* parent */
printf (“child PID % d\n”, child);
exit ( child);
}.
```

b) Write C program in which parent process will write unnamed pipe and will read from it.

c) Write a shell script to accept a filename from user and check whether it is directory regular readable file or regular writeable file. Give appropriate message accordingly.

d) Explain the behaviour of the following program:

```
# include < signal.h>
main ( )
{
extern catcher ( );
signal (SIGINT, catcher);
kill (0, SIGINT);
}
catcher ( )
{
}.
```

e) Explain the behaviour of the following program:

```
#Include <fcntl. h>
main ( )
        {
        int fd;
        char lilbuf [20], bigbuf [1024];
fd = open (“/etc/passwd”, O-RDONLY);
read (fd, lilbuf, 20);
read (fd, bigbuf, 1024);
read (fd, lilbuf, 20);
}.
```

Q5) Attempt any four of the following: **[4×4 = 16]**

a) Explain race condition for a locked buffer.

b) Explain block diagram of the system kernel.

c) Explain the various services provided by unix operating system.

d) Explain the various fields of process table.

e) Explain the components of system level context.

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Total No. of Questions :5]

SEAT No. :

P1244

[Total No. of Pages :2

[4638]-42

M.C.A. – II (ScienceFaculty)

CS-402:Advanced Networking and Mobile Computing

(Semester-IV) (2008 Pattern)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***All questions aer compulsory.***
2) ***Figures to the right indicate full marks.***
3) ***All questions carry equal marks.***

Q1) Attempt all: **[8×2=16]**

a) What is the different channel Allocation Scheme?

b) What is persistent connection in HTTP?

c) Define Domain name space.

d) Explain the term Multihoming.

e) What is difference between TCP & SCTP?

f) What is near and far terminal?

g) Define Base station.

h) Give any two differences between wireless networks with fixed networks.

Q2) Attempt any four of the following: **[4×4=16]**

a) Explain the term interference in the space, time, frequency multiple access.

b) How can MACA still fail in case of hidden/ expose terminal problem?

c) Write a short note on E-Mail Architecture.

d) Explain security layer of WAP. What problem does the WAP security Layer causes?

e) Explain the different types of registration process in Mobile IP.

P.T.O

Q3) Attempt any four of the following: **[4×4=16]**

a) Write a short note on Distributed Coordination Function (DCF).

b) What are the transaction services offered by WTP?

c) Explain the following term

i) Cell Breathing

ii) Handoff

d) Explain the flow control in TCP.

e) What is cellular system? Explain any two disadvantages of cellular system.

Q4) Attempt any four of the following: **[4×4=16]**

a) What are advantages & Disadvantage of Ad-hoc Network?

b) What multiplexing schemes are used in GSM & for what purpose?

c) Write a short note on MMS architecture.

d) How can DHCP be used for mobility & support to Mobile-IP?

e) Explain frequency hopping spread spectrum with its advantages and disadvantages.

Q5) Attempt any four of the following: **[4×4=16]**

a) Explain different Web Documents.

b) Explain GSM architecture.

c) What is snooping TCP? Explain advantages and disadvantages of snooping TCP.

d) What are the security issues that have been identified within current WAP architecture.

e) Write a short note on polling.

□□□

Total No. of Questions : 4]

SEAT No. :

P1245

[Total No. of Pages : 4

[4638]-43

M.C.A. (Science Faculty)

CS - 403 : DISTRIBUTED DATABASE SYSTEMS

(2008 Pattern) (Semester - IV)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

1) ***Figures to the right indicates full marks.***
2) ***Neat diagram must be drawn whenever necessary.***
3) ***All questions are compulsory.***

Q1) Attempt the following: **[8 × 2 = 16]**

a) Explain shared memory multiprocessor.

b) Give two architectural alternatives of DDBMS.

c) What is fragmentation? What are the correctness criteria for fragmentation?

d) What is query decomposition? List different steps in query decomposition.

e) Define:

i) conjunctive normal form.

ii) disjunctive normal form.

f) What is linear join tree and bushy join tree?

g) List timestamp based concurrency control algorithms.

h) Differentiate MTBF and MTTR.

Q2) Attempt any four: **[4 × 5 = 20]**

a) Explain in detail problem areas in DDBS environment.

b) Write a note on Horizontal Fragmentation.

c) Explain how analysis is done in query decomposition.

d) Write a note on deadlock management.

e) Explain In-place update recovery.

P.T.O.

Q3) Attempt any four: **[4 × 6 = 24]**

a) Let Q = {q1, q2, q3, q4, q5} be the set of queries,

A = (A1, A2, A3, A4, A5} be the set of attributes

S = {S1, S2, S3} be the set of sites.

The matrix (A), given below, describe the attribute usage values and matrix (B) gives application access frequencies. Assume that $ref_i(q_k) = 1$ for all q_k and S_i and that A4 is the key attribute. Do the vertical fragmentations of set of attributes using BE algorithm and vertical partitioning algorithm using matrix A and B.

Matrix (A)

	A1	A2	A3	A4	A5
q1	0	1	1	1	0
q2	1	1	1	0	0
q3	1	1	0	0	0
q4	0	0	0	1	1
q5	0	0	1	1	1

Matrix (B)

	S1	S2	S3
q1	20	4	0
q2	25	10	0
q3	15	0	0
q4	0	0	30
q5	0	20	25

b) Consider the following relational schema

Emp(eno, ename, title)

Proj(pno, pname, budget)

Asg (eno, pno, resp, dur)

Draw the query graph for the following query

Select ename, resp

from Emp, Asg, Proj

where Emp.eno=Asg.eno

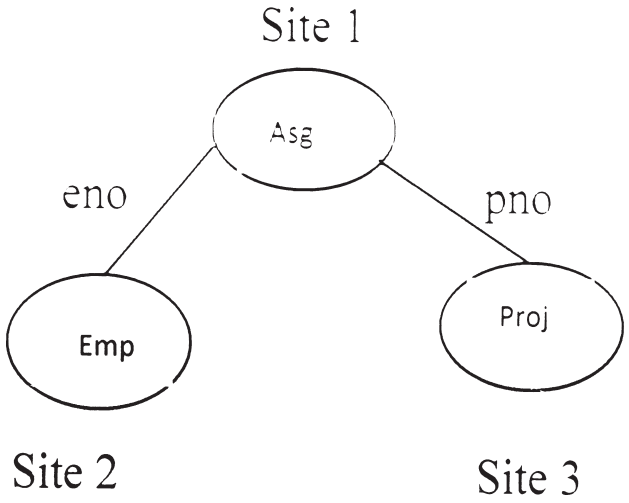
and pname = 'Instrumentation'

and title = 'Elect. Eng.'

and dur > = 24

What do you observe in query graph? What is the solution to this problem? Explain.

c) Consider the join graph in the following diagram for the relational algebra query proj $\bowtie_{pno}$ Asg $\bowtie_{eno}$ Emp



Let Size(Emp) = 200

Size(Asg) = 400

Size(Proj) = 600

Size(Asg $\bowtie$ Emp) = 600

Size(Asg $\bowtie$ Proj) = 400

Using the given information, describe a join program that will need minimum data transfer.

d) Consider the following schedule

S1 = $\{R_2(z), W_2(x), W_2(y), W_1(x), R_1(x), R_3(x), R_3(z), R_3(y)\}$

S2 = $\{R_3(z), W_2(x), W_2(y), R_1(x), R_3(x), R_2(z), R_3(y), W_1(x)\}$

Explain whether S1 and S2 are serial or non-serial? And also check whether S1 and S2 are serializable or not.

e) Assume the relation proj is fragmented as follows

proj1=σ_{pno}<'p2' (proj)

proj2=σ_{pno}>='p2' (proj)

Assume the relation asg is fragmented as follows

Asg1 = σ_{pno}<='p2' (asg)

Asg2 = σ'p2'<pno<'p5' (asg)

Asg3 = σ_{pno}>='p5' (asg)

Transform the following query into a reduced query on fragments

```
select pname
from asg, proj
where asg.pno=proj.pno
and proj.budget <2,00,000
and asg.dur=24
and proj.pno='p3';
```

Q4) Attempt any four: **[4 × 5 = 20]**

a) Explain client server architectural model.

b) Write a note on workflow.

c) Explain 3 phase commit protocol.

d) Explain C2PL locking based concurrency control algorithm.

e) List different LRM algorithm. Explain any two in detail.

Total No. of Questions : 4]

SEAT No. :

P1246

[Total No. of Pages : 2

[4638]-44

M.C.A. (Science Faculty)

CS - 405 : Object Oriented Software Engineering

(2008 Pattern) (New) (Semester - IV)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt the following: **[8 × 2 = 16]**

a) What is swimlane?

b) What is aggregation?

c) What is forward engineering?

d) What is Rational Unified Process?

e) What is Validation Testing?

f) What is Domain Model?

g) Explain the use of include relation in Use Case diagram.

h) Qualifiers reduce multiplicity. Justify whether True or False.

Q2) Attempt any four of the following: **[4 × 8 = 32]**

a) Draw class diagram showing relationship among the following classes. Include association, aggregation and generalization. Show multiplicity. You may add additional attributes if necessary.

Playground, School, Principal, Classroom, Student, Book, Teacher, Board, Computer, Desk, Chair, Door.

b) Prepare a state transition diagram for the control of a telephone answering machine. An incoming call is detected on the first ring and the machine answers the call with a prerecorded announcement. When the announcement is complete, the caller's message is recorded. When the caller's message is recorded, the caller hangs up and the machine becomes idle.

P.T.O.

c) Draw Use Case diagram for a system for processing results of students. The student fills examination form giving details about subject and centre etc. Student pays examination fees and given fee receipt and the admission card. Examination is conducted at various centres. Centers provide the absentee report. The evaluation department provides marks of students in each subject. The mark sheet and the merit list are generated.

d) Prepare object diagram showing at least six relationships among the following object classes. Show multiplicity.

File System, File, Directory, Disk, Drive, Track, ASCII file, Ordinary file, and executable file.

e) The library contains books and journals. It may have several copies of a given book. The books may be borrowed by any library member for three weeks. Only members of staff may borrow journals. Members of the library can normally borrow up to five items at a time, but members of staff may borrow up to ten items at a time. New books and journals arrive regularly and old once sometimes disposed off. Draw Sequence diagram and Activity diagram.

Q3) Attempt any four of the following: **[4 × 4 = 16]**

a) Explain the components of Activity diagram.

b) What are the different steps used in system design process.

c) Draw a class diagram giving attributes and operations for stack and queue implemented using linked list.

d) Explain common mechanisms in the UML.

e) Explain integration testing.

Q4) Attempt any four of the following: **[4 × 4 = 16]**

a) Draw a component diagram for Railway Reservation System.

b) Define UML. Explain the advantages of UML.

c) Draw state transition diagram for different operations supported by washing machine.

d) Explain iterative development life cycle with neat diagram.

e) Write note on Agile UP.

Total No. of Questions :5]

SEAT No. :

P1249

[Total No. of Pages :2

[4638]-53
M.C.A .- III (Under Science Faculty)
CS - 503: DESIGN PATTERN
(2008 Pattern) (Semester - V)

Time : 3 Hours] *[Max. Marks :80*

Instructions to the candidates:

1) ***All questions are compulsory.***
2) ***Neat diagrams must be drawn wherever necessary.***
3) ***Figures to the right indicates full marks.***

Q1) Attempt the following (All): **[8x2=16]**

a) Define:

i) Pattern

ii) Design pattern

b) What makes pattern?

c) What are participants of decorator design pattern?

d) What is the intent of singleton design pattern?

e) State the structure of command design pattern.

f) What is blackboard architecture?

g) "Idioms are highly portable between programming languages". Justify true or false.

h) What is an Idiom?

Q2) Attempt the following (Any Four): **[4x4=16]**

a) What are consequences of adaptor design pattern?

b) Explain the steps to implement pipe & filters architectural pattern.

c) Define model view controller architectural pattern. Explain document view.

d) Give intent, structure and concequences of strategy design pattern.

e) Explain how and when to use singleton design pattern.

P.T.O.

Q3) Attempt the following (Any Four): **[4x4=16]**

a) Write a short note on layered architecture.

b) Give intent, participants, collaboration and implementation of command design pattern.

c) Write a short note on catalog organization of design pattern.

d) What are benefits and liabilities of observer design pattern.

e) Explain in detail broker architectural pattern.

Q4) Attempt the following (Any Four): **[4x4=16]**

a) What is decorator design pattern? What are the uses of it?

b) Explain proxy design pattern with neat diagram.

c) Give structure of class and object of Adaptor design pattern.

d) Give participants and benefits of prototype design pattern.

e) Give structure and participants of abstract factory.

Q5) Attempt the following (Any Four): **[4x4=16]**

a) Explain Adaptor design pattern with the help of structure and implementation issues.

b) What are consequences of command design pattern.

c) What are strengths and weaknesses of strategy design pattern.

d) Explain counted pointer idioms with the steps of implementation.

e) What are the differences between abstract factory and singleton design pattern.

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Total No. of Questions : 5]

SEAT No. :

P1250

[Total No. of Pages : 2

[4638] - 54
M.C.A. - III
SCIENCE FACULTY
CS-505: Software Testing and Quality Assurance
(2008 Pattern) (Semester - V)

Time : 3 Hours] *[Max. Marks : 80*

Instructions to the candidates:

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

Q1) Attempt all of the following: **[8×2 = 16]**

a) What is perfermance testing?

b) What is Alpha testing?

c) Explain flow graph notations.

d) Explain condition testing.

e) What is Quality Assurance?

f) What is testing documents?

g) Define testing.

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

Q2) Attempt any four of the following: **[4×4 = 16]**

a) What is SQA plan?

b) How to test Real-time systems? Explain.

c) Differentiate between Black Box and white Box testing.

d) State and explain testing principles.

e) Explain measure of Reliability and Availability.

P.T.O.

Q3) Attempt any four of the following: **[4×4 = 16]**

a) Explain Loop testing.

b) What are characteristics of good test?

c) Explain code coverage criteria in white Box testing.

d) Explain Mc Call's Quality factors with diagram.

e) Write steps for Deriving test cases.

Q4) Attempt any four of the following: **[4×4 = 16]**

a) Write steps for drawing scatter diagram. Give different scatter diagram patterns.

b) What is Unit testing?

c) Explain Regression testing.

d) Explain function-Based Metric.

e) Explain formal Technical Review.

Q5) Attempt any four of the following: **[4×4 = 16]**

a) Load runner.

b) ISO 9001 Quality standard.

c) Pareto diagram.

d) Quality Cost.

e) Software safety.

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