[5540]-101

M.Sc. (Computer Science) (Semester - I)
CS : - 101 (New) : Principles of Programming Languages
(2011 Pattern)

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.*
4) *Neat diagrams must be drawn wherever necessary.*
5) *Assume suitable data, if necessary.*

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

a) What do you mean by Von Neumann languages? Why the name Von Neumann?

b) Evaluate the following forms :

   i)   (cadar ' ((ab) (cd) (ef)))

   ii)   (cadadr ' ((ab) (cd) (ef)))

c) Give 2 differences between free and anonymous variables of prolog.

d) List the two common mechanisms for dynamic pool adjustment.

e) Which expressions are valid l - values in c/c++? Why? Assume the declarations as :

int n, a [2], *p;

   i)   n+1   ii)   *(p+1)

   iii)   a[n]   iv)   3

f) What do you mean by fully qualified reference and elliptical reference to a record field.

g) What is coroutine? What is quasi-concurrency in case of coroutines?

h) "Private members of base class are inherited in derived class". Justify whether true or false.

P.T.O.

i) For a class typed variable in c++, why is it better to provide an initial value in the declaration rather than in an assignment statement immediately there after.

j) What is rendezvous? When it can occur?

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

a) Explain how IDE differs from a collection of command line tools.

b) Explain stack based and heap based memory allocation with suitable diagrams.

c) What are common uses of goto & its structured alternatives?

d) Explain the eager approach and lazy approach to garbage collection.

e) Explain how replicated multiple inheritance is implemented using suitable diagram.

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

a) Consider the following pseudocode, designed to count the number of elements greater than x in a very large array. Explain the race condition and describe how to fix it.

int greater - than (double M[N] [N], int N, double x)
{
    int count : = 0 ; int num-threads;
    void worker (int t)
    {
       for (r : = 0; r < N ; r++)
        if (r% num_threads = = t)
          for (c : = 0 ; C < N ; C++)
           if (M[r][c] > x)
            count ++;
    }
    for (i : = 0 ; i < num_threads ; i++)
       fork worker (i);
       join all;
       return count
    }

b) Show linear jump table implementation of switch statement given below. Generate the target code for the same.

   CASE - - (* some expression *) OF

        1 :   clause - A

   ¦ 2, 7 :   clause - B

   ¦ 3 - - 5 : clause - C

   ¦ 10 :   clause - D

   ELSE   clause - E

   END

c) Consider the following declarations :

       int   A[5] [10];

   Assume that an integer needs 4 bytes of storage. Compute address of A[3] [7] using row - major and column major order. Assume A[0] [0] is at address 1000.

d) Explain the 2 methods of implementing blocks.

e) Explain fragile base class problem.

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

a) What are Associative Arrays? What are various ways for implementing Associative Arrays?

b) What is an abstract class? If foo is an abstract class in C++ program, why is it acceptable to declare variables of type foo *, but not of type foo?

c) Assume that language permits nested subroutines and also allows subroutines passed as a parameter to another subroutines. List and explain 3 choices for deciding referencing environment for a subroutine passed as a parameter.

d) What is concurrency? Explain physical and logical concurrency.

e) Consider following pseudocode,
   let x = 1 - - global
   proc A
   let x = 2
   proc B(P)
       {
          let x = 3
          call P
       }
   {   - -   body of A
          call B (C)
   }
   proc C
   {   print x
   }
   main ( )
   {   call A
   }
   What does this print - with lexical scope?
   - with dynamic scope and shallow binding?
   - with dynamic scope and deep binding?

Q5) Attempt any four of the following :   **[4 × 4 = 16]**
   a) John likes all animals. cat, bird, dog and snake are animals. Write a
       prolog program such that Goal : likes (john, snake) will return false,
       whereas for other animals it will return true. (Using cut and fail prediates)
   b) Write a prolog program to find 'N' factorial (N!).
   c) Assume the following sentences :
       Bob likes cake, pie, juice. Andy like pie, juice, chocolates, cake. Price of
       cake is ₹ 200, price of pie is ₹ 50, price of juice is ₹ 80, price of chocolate
       is ₹ 60. Andy and Bob decided to buy only those items which they both
       like and whose price is < (less than) ₹ 100. Write a prolog program to
       find what items they will buy.
   d) Write a recursive LISP function count remove which takes two arguments,
       first an atom and second a list and returns a list after removing all
       occurrences of the atom from the list.
       eg. (countRemove (3'(231 34))) o/p → (2 1 4)
   e) Define a Lisp function to find union of two lists; given as arguments.

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[5540]-102
M.Sc. (Computer Science)
Advanced Networking
(2011 Pattern) (Semester - I)

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 : [8 × 2 = 16]

  a) Define remote procedure call.

  b) Define kerberos. Also list the parties involved in same process.

  c) What is a use of IV in CBC mode?

  d) State key participants in SET protocol.

  e) Explain DNS spoofing.

  f) Write a short note on Anonymous Emoney.

  g) State difference between RTP and RTCP.

  h) Define plain text & cipher text.

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

  a) Epxlain principle of security.

  b) consider the following routing table for router R1.

| Mask	Network Address	Next Hop	Interface
/26	180.70.165.192	-	m2
/25	180.70.65.128	-	m0
/24	201.4.22.0	-	m3
/22	201.4.16.0	-	m1
Default	Default	180.70.65.200	m2

i)   Show the forwarding process, if a packet arrives at R1 with destination address 201.4.22.40.

ii) Show the forwarding process, if a packet arrives at R1 with destination address 20.24.30.75.

c)   What is the need of multiplexing in Transport layer?

d)   Explain the concept of voice over IP.

e)   List & explain any four types of certificates in user authentication techniques.

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

a)   Explain the steps in various rounds of AES.

b)   What is frame relay? Discuss its advantages.

c)   Show which router sends out router link and network link LSA in following diagram :
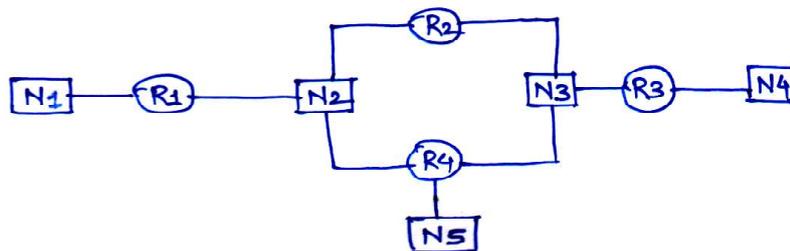
d)   Create public key and private key by applying RSA algorithm for P = 11 & Q = 23.

e)   Write a short note on ICMPv4 packages.

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

a)   Differentiate between distance vector routing and link state routing.

b)   What is attack? Explain active & passive attack.

c)   Explain different strategies of transition from IPv4 to IPv6.

d)   State Email security protocols. Explain any one.

e)   Explain the structure of router.

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

    a)   Explain any four advantages of IP security.

    b)   Explain the design goals of ATM.

    c)   Short note on TCP handling of windows management.

    d)   Explain Services provided by UDP & TCP.

    e)   Explain different types of firewalls.

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[5540]-103

M.Sc. (Semester - I)

COMPUTER SCIENCE

CS - 103 : Distributed Database Concepts

(New Pattern)

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 any 8 :   **[8 × 2 = 16]**

   a)   Define the following :

       i)   Location transparency

       ii)   Naming transparency

   b)   Define a distributed catalog. State any two ways of managing a distributed catalog.

   c)   State any 2 reasons for fragmenting data in a DDB.

   d)   State atleast 4 characteristics of a query processor.

   e)   Convert the following query qualification into CNF (Conjunctive Normal Form).

       Select pname from player p, game - player gp. where p.pno = gp.pno and gp. gno = "g1" and (role = "batsman" or role = "bowler")

   f)   Consider the following query select pname, gname, hobby from player p, game g, gp, player - hobby ph. Where p.pno = gp.pno and g.gno = gp. gno and gname = "Cricket" and p.pno = ph. pho and hobby = "Stamps". Define a linear join tree and a bushy join tree & draw the same for the above query.

   g)   State a formula for computing the total cost, in terms of the local processing time and communication time, for the following strategies.

       i)   Ship - whole strategy

       ii)   Fetch as needed strategy

h) "Local transaction managers guarantee atomicity for subtransactions, which is sufficient to provide atomicity at distributed level". State true/false. Justify your answer in 2 sentences.

i) Define the following, for a commit protocol

    i) A centralized communication structure

    ii) A distributed communication structure

j) Define the concept of serializability of distributed transactions.

Q2) Answer any 4 :   **[4 × 4 = 16]**

a) "A fully or partially replicated database improves availability of data and also improves locality of reference; but affects the response time for updates". Comment on the above.

b) Comment on the following :

"The GCS in a MDBS architecture is a subset of union of all LCS; whereas in a peer-to-peer architecture its a union of all LCS".

c) Comment on the following :

"Disjointness of a derived fragmentation can be guaranteed only if the join graph is a simple graph".

d) Comment on the following :

"Dynamic query optimization approach is best for adhoc queries".

e) Comment on the following :

"A useful transformation rule for optimizing queries containing derived fragments, is to distribute joins over the unions.

**Q3)** Solve any 4:   **[4 × 4 = 16]**

a) Given the following fragmentation of relation department (dno, dname, dbudget, dloc), which splits the relation into low-budget and high-budget departments, as follows :

low-budget : σ (department)
                      dbudget $\leq$ 1,00,00,00

high-budget : σ (department)
                      dbudget > 1,00,00,00

Consider the relation Employee (eno, ename, dno, salary). Fragment it into relations by separating attribute ename. The obtained relation with all the other attributes is to be fragmented into high-salaried (sal > 10000) and low-salaried (sal ≤ 10000). The high-salaried employees shall once again be partitioned into those belonging to low-budget departments and those belonging to high-budget departments.

i) Provide Relational Algebra expressions necessary to partition the relation employee. Indicate which kind of fragmentation is used.

ii) Draw the join graph for employee $\bowtie_{dno}$ department and state its type.

b) Given the following relations

Account (Ano, client-no, Balance)

Client (client-no, name, birth-date, branch)

Client-no is the foreign key in Account relation.

i) Formulate a query (in SQL and RA) that asks for account holders affiliated to branches in Chennai and Mumbai, who overdraw their accounts (balance ≤ 0).

ii) Define a simplified operator tree corresponding to the RA expression.

iii) Extract the selection predicate from the query and transform it into DNF (Disjunctive Normal Form).

c) Consider the following join graph, for the join of the following relations.
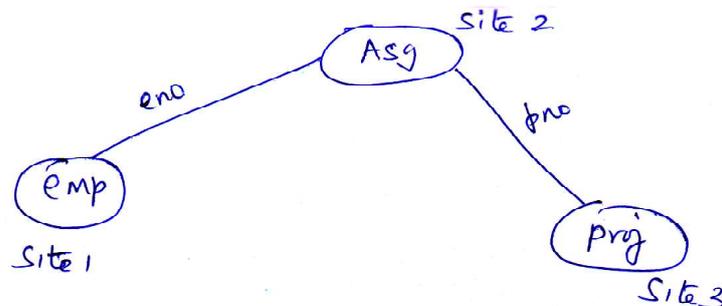
proj ∞ Asg ∞ emp.

The fragmentation information is as given below :

| Relation	Site 1	Site 2	Site 3
emp	1000	1000	1000
Asg		2000	
proj	1000		

Further, assume the size of (emp ∞ Asg) = 2000 and size of (Asg ∞ proj) = 1000.

Apply the algorithm of distributed ingres and decide the best approach for join, so that communication time is minimized, in the following 2 cases :

i) A point-to-point n/w

ii) A Broadcast n/w

d) Consider the following join graph of the following relations :

game (gno, gname)

player (pname, pno, ptitle)

game_player(gno, pno)

pay (ptitle, salary)
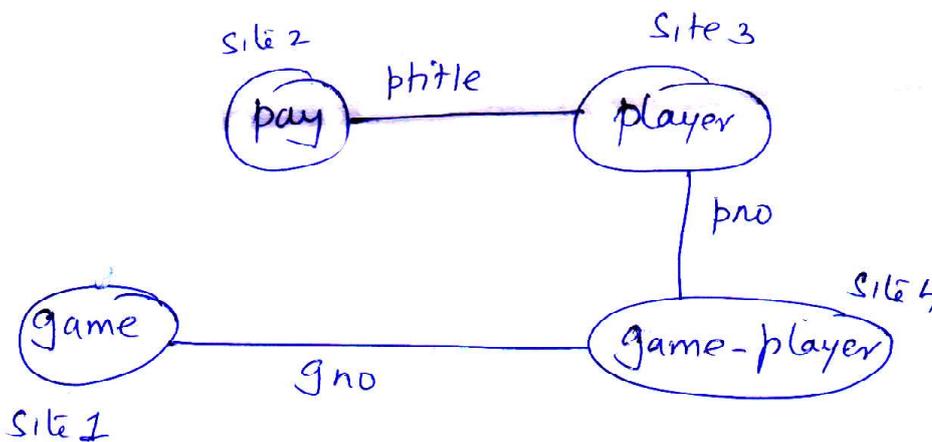
The following is the statistics of the relations

relation	size	site
game	8	1
pay	4	2
player	1	3
game-player	10	4

Assume the length of a tuple for each relation = 1, size of the relation = cardinality of the relation,

Tmsg = 0 and Tir = 1

size (player ∞ pay) = size (player)

size (game ∞ game-player) = 2*size (game)

size (game-player ∞ player) = size (game- player)

Apply SDD-1 algorithm and obtain a feasible solution for the join program of game ∞ game-player ∞ player ∞ pay.

e) Consider the following 2 transactions :

$T_i : R_i(x), W_i(x), R_i(y), W_i(y)$

$T_j : R_j(x), W_j(x), R_j(y), W_j(y)$

Assume that initially RTM(x) = 25 and WTM(x) = 25, RTM(y) = 30 and WTM(y) = 30.

Determine atleast 2 possible executions and transaction restarts in the following cases :

i) Ts(Ti) = 35, Ts(Tj) = 40

ii) Ts(Ti) = 20, Ts(Tj) = 40

Q4) Answer any 4 : [4 × 4 = 16]

a) A company has 3 divisions : Tools (T), Finance (F), Sales(S). All departments are assigned to one of these divisions, as follows :

Departments 100 – 250 are assigned to Tools.

Departments 251 – 400 are assigned to Finance.

Departments 401 – 499 are assigned to sales.

The analysis of applications used in these departments resulted in the following access ranges on

The relation department (dno, dname, division, budget)

A1 : Access to tuples in division Tools.

A2 : Access to tuples in division Finance.

A3: Access to tuples in division Sales.

A4 : Access to tuples with department numbers in the range [100–150].

A5 : Access to tuples with department numbers in the range [151–299].

A6 : Access to tuples with department numbers in the range [300–499].

Apply the Horizontal fragmentation algorithm and obtain the necessary fragments.

b) Write a short note on "The use of semijoins in query processors, specifically to reduce the communication cost".

c) Consider the following relations :

Supplier (Sno, Sname, Code, City)

Parts (Partno, partname, Sno, price)

Consider the following query :

Select partname, Sname from supplier S, parts p, where p. price < 50 and S. code = "internal".

Apply the algorithm of jngres, to optimize the above query and illustrate the successive detachments and substitution, by giving the monorelation subqueries generated.

d) Consider the following dwfg
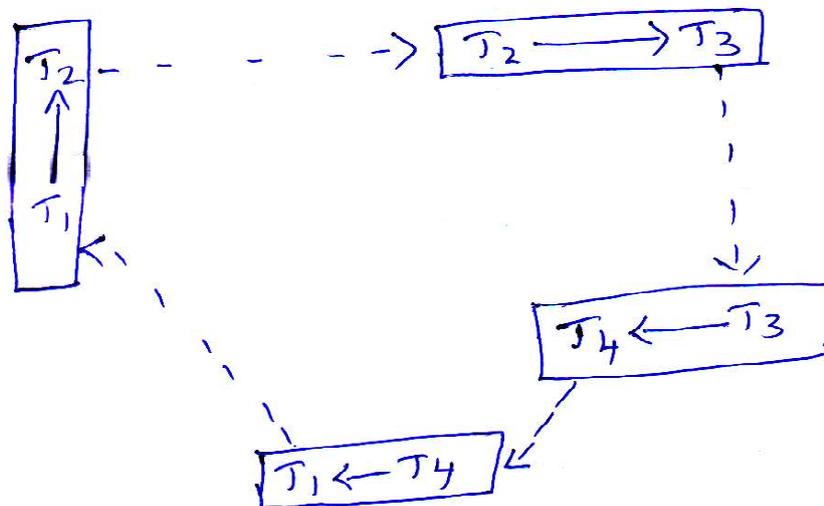
Detect for a deadlock, using the distributed deadlock detection algorithm.

e) Write a short note on "Classification of LAZY Replication Protocols" in a DDBMS.

Q5) Answer any 4 :   **[4 × 4 = 16]**

   a)   Write a short note on Reduction for Primary Horizontal fragmentation, with focus on:

      i)   Reduction with selection.

      ii) Reduction with joins.

   b)   State the different methods used by a DTM in order to deal with conflicts in locking multiple copies of data, in a distributed environment. Explain briefly any one of them.

   c)   Write a short note on "The drawbacks of conservative Time stamp ordering method for concurrency control in a distributed database environment".

   d)   Write a short note on communication failures in a distributed database environment.

   e)   Write a short note on the correctness rules for fragmentation.

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[5540]-104

M.Sc. (Semester - I)

COMPUTER SCIENCE

CS - 104 : Design and Analysis of Algorithms

(2011 Pattern)

*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.*

4) *All questions carry equal marks.*

5) *Assume suitable data, if necessary.*

Q1) Attempt any EIGHT from the following : $[8 \times 2 = 16]$

a) What do you mean by stable sorting? List any two stable sorting algorithms.

b) Define θ notation. Show that $3n + 2 = \theta(n)$.

c) Devise a ternary search algorithm that uses Divide and conquer strategy.

d) Differentiate between subset paradigm and ordering paradigm of greedy strategy.

e) How dynamic programming differ from Greedy method and Divide & conquer strategy.

f) Give Breadth first and Depth first Traversal for following graph, starting at A, if neighboring nodes are picked in alphabetical order.
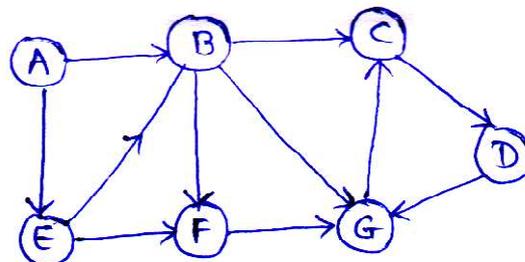

g) Give the implicit and explicit constraints of 8-queen's problem.

h) State the 0/1 knapsack problem which uses Branch and Bound technique.

P.T.O.

i) Use Horner's rule to evaluate the polynomial
$3x^4 + 2x^3 + 8x^2 + 9x + 1$ at $x = 2$

j) Define :
   i) NP - complete class of problems
   ii) NP - hard class of problems

Q2) Attempt any FOUR from the following : **[4 × 4 = 16]**

a) Devise a recursive permutation generator to print all possible permutations of given set of $n \geq 1$ elements. Also, find its running time in terms of number of elements n in the set.

b) Explain any sorting method that uses Divide and conquer strategy. Also discuss its best case and worst case time complexity.

c) Find an optimal solution to the fractional knapsack problem instance $n = 7$, $m = 15$, p=(10, 5, 15, 7, 6, 18, 3) and w = (2, 3, 5, 7, 1, 4, 1).

d) Let X = (2, 3, 8, 6, 1) and Y = (3, 2, 6, 6). Find a minimum cost edit sequence that transforms X into Y. Assume that each insertion and deletion has a unit cost and a change costs 2 units.

e) Show the ordering of vertices produced by Topological sort for the following graph.
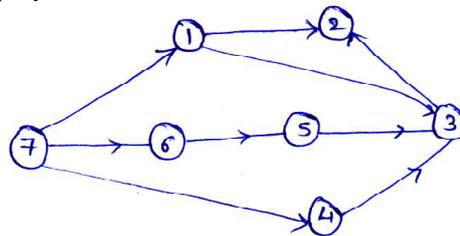
Q3) Attempt any FOUR from the following : **[4 × 4 = 16]**

a) Apply backtracking to solve the following instance of sum of subsets problems :
   w = (15, 7, 20, 5, 18, 10, 12) and m = 35

b) Draw the portion of the state space tree generated by LCBB for the knapsack instance n = 5, m = 12, p = (10, 15, 6, 8, 4) and w = (4, 6, 3, 4, 2).

c) Determine the polynomial of smallest degree that interpolates the points (0, 1), (1, 2) and (2, 3).

d) State Cook's theorem and explain significance of it.

e) Given a sorted array of n numbers containing all but one of integers in the range 1 through n + 1. Devise a divide and conquer based algorithm that determines the missing number.

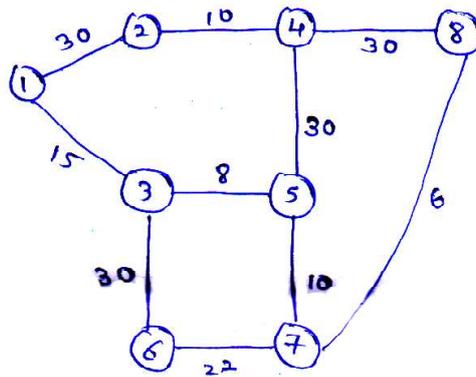*Q4)* Attempt any TWO from the following :   [2 × 8 = 16]

a) Give control abstraction for divide and conquer strategy.

How Strassen's matrix multiplication differs from ordinary matrix multiplication algorithm? Derive time complexity required by Strassen's method. Use Strassen's algorithm to compute product of following matrices, giving each computational step.

$$\begin{bmatrix} 2 & -1 \\ 3 & 0 \end{bmatrix} \begin{bmatrix} 6 & -2 \\ -3 & 4 \end{bmatrix}$$
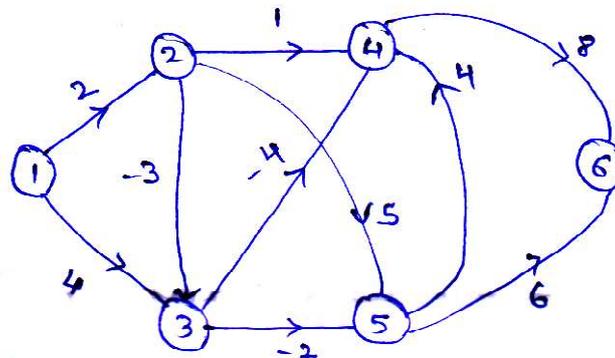$$\quad\quad A \quad\quad\quad B$$

b) Define minimum spanning tree. Compare Kruskal's and Prim's algorithm.

Apply Prim's and Kruskal's algorithm to find minimum spanning tree of following graph :

c) Write Bellman Ford algorithm and apply it on the following graph :

Find shortest paths from node 1 to every other node in following graph:

Q5) Attempt any Two from the following : [2 × 8 = 16]

a) What are strongly connected components? Write down the steps carried out to find strongly connected components of given digraph G.

Find strongly connected components of following graph :
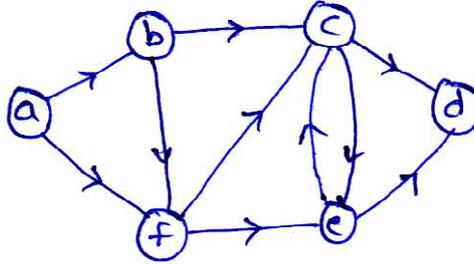
b) What is m-colorability graph problem? Write an algorithm to solve the same using backtracking.

Find the solution for following graph where number of colors, m = 3 and number of vertices, n = 4.
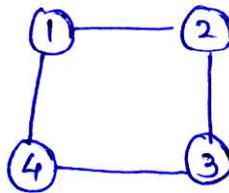
c) State Travelling salesman problem. Consider the travelling salesman instance defined by the following cost matrix. Obtain reduced cost matrix.

Which node will be selected next in LCBB approach?

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

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[5540]-12

M.Sc. (Computer Science)

CS-102 : OBJECT ORIENTED SOFTWARE ENGINEERING

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

  4)   *Assume data whenever necessary.*

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

  a)   What is object orientation?

  b)   Explain structural things.

  c)   What is testing?

  d)   How subsystems can be organized?

  e)   What is realization?

  f)   What are the differences between a link and association?

  g)   Explain the concept of elaboration in short.

  h)   What are the goals of UML?

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

  a)   Discuss the components of use case diagram.

  b)   Explain the different phases of unified process.

  c)   Write a short note on Raumbaugh method.

  d)   Explain the concept of forward and reverse engineering with example.

  e)   What is a qualifier? Explain with example.

Q3) Attempt any four of the following :   [4 × 8 = 32]

    a)   Prepare an object diagram showing at least 6 relationships among the following object classes " Expression, constant, variable, function argument list, relational, operation, term, factor, arithmetic operator, statement, program.

    b)   Draw an use case diagram for "Library management system".

    c)   Draw sequence diagram and state chart diagram for ATM machines considering different scenarios.

    d)   Draw component and deployment diagram for "E - mail system".

    e)   Draw activity and state diagram for the process of creating a document.

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

    a)   Explain object oriented testing strategy.

    b)   Write a short note on inception and requirement understanding.

    c)   Explain the concept of generalization with suitable example.

    d)   Draw collaboration diagram for "Railway reservation system".

    e)   Draw a sequence diagram for a "Telephone line".

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[5540]-201

M.Sc. (Semester - II)
COMPUTER SCIENCE
CS - 201 : Digital Image Processing
(2011 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates :
1) *Question No. 1 is compulsory.*
2) *Attempt any four from the remaining.*
3) *Neat diagrams must be drawn wherever necessary.*
4) *Figures to the right indicate full marks.*

Q1) Attempt all of the following :

[8 × 2 = 16]

a) List any two sources used for Image acquisition along with applications.

b) Mention the two segmentation approches.

c) State convolution theorem.

d) Give reason. Image negative transformation is suited for enhancing white or gray detail embedded in dark region of an Image.

e) Mention two ranges of EM spectrum used for imaging Give one application each.

f) Why it is easy to remove periodic noise using frequency domain processing.

g) Mention two ways of estimating degradation function.

h) Define colour slicing.

Q2) a) Explain the role of different components of general purpose digital Image processing system. **[8]**

b) Define 8-adjacency & m-adjancency. What is the advantage of m-adjacency. **[4]**

c) What are the fundamental steps in edge detection? **[4]**

Q3) a) Explain the role of image sampling and quantization in forming a digital image. **[8]**

b) Given below is 'x' : a section of horizontal intensity profile from an image. Illustrate the 1st and 2nd derivative of the 1-D digital function represented by 'x'. Depict zero crossing, if any **[4]**

x :

5	5	5	5	5	2	2	2	2	2	2	3	4	5	5	5	6	6	6	6

c) Write the iterative algorithm for global thresholding. **[4]**

Q4) a) Describe the model of Image Degradation/Restoration process. State the various noise models and typical situations in which they occur. **[8]**

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

c) Explain zooming and shrinking in digital Images. How does it take place? **[4]**

Q5) a) State the equations for 2-D discrete fourier transform and it's inverse. Describe any two properties of 2-D discrete fourier transform. **[8]**

b) Illustrate the use of chain codes. **[4]**

c) Why is smoothing and sharpening necessary in colour imaging. **[4]**

Q6) a) Explain local processing for edge linking. **[8]**

b) Explain the steps in frequency domain processing of digital Image. **[4]**

c) Write a short note on 'Signatures'. **[4]**

Q7) a) What is colour model? Give it's types and explain any two of them. **[8]**

b) What is a 'Max' and 'Min' filter? Which type of noise can be best removed using these filters. **[4]**

c) Draw the shapes for the order n = 4, 6 & 8 also give their chain code representations, first difference and shape number. **[4]**

Q8) a) Given a 3-bit image of size 64×64 pixel having intensity distribution as shown in the table given below, where intensity levels are in the range 0-7. Apply histogram equalization technique and find the transfer function $T(r)$ which relates input image intensity level R_K to output Image intensity S_K. **[8]**

Intensity level	Number of Pixels
$R_0 = 0$	790
$R_1 = 1$	1023
$R_2 = 2$	850
$R_3 = 3$	656
$R_4 = 4$	329
$R_5 = 5$	245
$R_6 = 6$	122
$R_7 = 7$	81

b) Explain low pass filtering in frequency domain. **[4]**

c) Define 'Opening' and 'Closing' operations. In what way do they differ from each other. **[4]**

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[5540]-202

M.Sc. (Semester - II)

COMPUTER SCIENCE

CS - 202 : Advanced Operating Systems

(2011 Pattern)

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

Instructions to the candidates :

1) *All questions are compulsory.*
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 of the following :   **[8 × 2 = 16]**

a)   List types of files with respect to Linux O.S.

b)   What are the common sections of processes.

c)   Explain copy - on - write.

d)   Explain any two thread functions of windows.

e)   Explain chmod( ) & fchmod ( ) system calls.

f)   What is process identifier.

g)   What is ACL?

h)   What is the syntax of mmap ( ). Explain.

Q2) Justify the following (any eight) :   **[8 × 2 = 16]**

a)   No process can pre-empt another process executing in kernel.

b)   Dup ( ) system call duplicates the contents of file.

c)   The kernel must sometimes prevent the occurence of interrupts during critical activities.

d)   In windows, worker factories refer to the internal mechanism used to implement user mode thread pools.

e)   Random access I/o is not possible for pipes files.

f) U - area of a process is accessible only in kernel mode.

g) Windows implements a priority driven pre-emptive scheduling system.

h) The default action of process is exit whenever it receives SIGCHLD signal.

i) The inode - lock when set, prevents other processes from accessing the inode.

j) At the kernel level, support for protected process is two fold.

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

a) Draw and explain process state & transition diagram.

b) Explain kill and raise system calls.

c) Explain birth of thread in windows.

d) Explain Advanced memory allocation with six values for param defined in <malloc.h> in Linux.

e) Give seven stages for creation of a process in windows.

Q4) Explain the behavior of the following (any four) : **[4 × 4 = 16]**

a) main ( )
```
{
int fd;
char buf [1024];
fd = create ("junk", 0666);
lseek (fd, 2001, 2);
write (fd, "hello", 5);
close (fd) ;
sd = open ("junk", O_RDONLY);
read(fd, buf, 1024)
read(fd, buf, 1024)
read(fd, buf, 1024)
}
```

b)
```
main ( )
{
int status;
if (fork ( ) = = 0)
        excel ("/bin/date", "date", 0)
        wait (& status);
}
```

c)
```
main ( )
{
char * endpt;
char * sbrk ( );
int brk ( );
endpt = sbrk (0);
printf ("endpt = % ud after sbrk\n", (int endpt));
while (endpt - -)
{
    if (brk (endpt = = –1)
    {
        printf("brk of % ud failed \n", endpt);
        exit ( );
    }
  }
}
```

d)
```
# include <stdio.h>
main (int argc, char * argv [ ])
{
char buf [256];
if (argc ! = 1)
signal (SIG_CLD, SIG_IGN);
while (read (0, but, 256)
if (fork ( ) = = 0)
exit (0);
}
```

e) main ( )

    {

    int i;

    for (i = 0; i < 4; i + +)

        fork ( );

        printf ("My pid =% d \ n", getpid ( ));

    }

    How many times printf will be executed.

Q5) Write a c program for the following (any four) :   **[4 × 4 = 16]**

   a) Write a c program to read data from standard input & write it directly to user defined file.

   b) Write a c program to open a file in write append mode. suppose the size of the file is n bytes. At the $(n + 100)^{th}$ byte in the same file, write the string "unix".

   c) Write a c program to demonstrate Race condition in catching signals.

   d) Write a c program to demonstrate use of at exit ( ) function.

   e) Write a c program to print type of file for each command line argument.

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[5540]-203

M.Sc. (Computer Science)

CS - 203 : Data Mining and Data Warehousing

(2011 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates :
1) *Al questions are compulsory.*
2) *Draw neat diagrams wherever necessary.*
3) *Figures to the right indicate full marks.*

Q1) Attempt any EIGHT of the following :

[8 × 2 = 16]

a) Discuss whether the following is a data mining task, "Predicting the future stock price of a company using historical records".

b) What is a data cube?

c) Give an example of summarization.

d) List out the tasks carried out in text mining.

e) State the Apriori property.

f) List steps of KDD process.

g) What is precision and recall?

h) What is a decision tree?

i) What is CART?

j) What is a dendrogram?

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

a) Write a note on web mining.

b) How is data transformation carried out using normalization?

c) Differentiate between OLAP and OLTP.

d) Write a note on Tree pruning.

e) Explain data mining applications.

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

a) Suppose that a data warehouse consists of the three dimensions time, doctor and patient, and the two measures count and charge, where charge is the fee that a doctor charges a patient for a visit.

i) Draw snow flake schema for the above data warehouse.

ii) Starting with the base cuboid (day, doctor, patient), what specific OLAP operations should be performed in order to list the total fee collected by each doctor in 2010?

b) The following table consists of training tuples from all electronics customer database.

RID	Age	Income	Student	Credit_rating	Class : buys_computer
1	youth	high	no	fair	no
2	youth	high	no	excellent	no
3	middle - aged	high	no	fair	yes
4	senior	medium	no	fair	yes
5	senior	low	yes	fair	yes
6	senior	low	yes	excellent	no
7	middle - aged	low	yes	excellent	yes
8	youth	medium	no	fair	no
9	youth	low	yes	fair	yes
10	senior	medium	yes	fair	yes
11	youth	medium	yes	excellent	yes
12	middle - aged	medium	no	excellent	yes
13	middle - aged	high	yes	fair	yes
14	senior	medium	no	excellent	no

      i)   Draw a decision tree for the concept buys - computer.

      ii)   Compute information gain of the attribute age, to find the splitting criterion for the tuples. (The class label attribute buys_computer has two distinct values. Let class C1 correcspond to number of 'yes' and class C2 correspond to number of 'no'.)

  c)   Write a note on Hierarchical clustering.

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

  a)   Write a note on the attribute selection measure - Gain Ratio.

  b)   Write a note on Data mining Issues.

  c)   Explain data warehouse models :

      i)   Enterprise warehouse

      ii)   Data mart

  d)   Write a note on FP - Tree.

  e)   What are the major tasks in Data preprocessing?

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

  a)   Generate frequent item sets for the following set of transactions with minimum support = 3.

TID	Item
1	E, A, D, B
2	D, A, C, E, B
3	C, A, B, E
4	B, A, D
5	D
6	D, B
7	A, D, E
8	B, C

b) The following table contains training data from a car theft database containing attributes : Color, type, origin and stolen. Let 'Stolen' be the class label attribute. Given a data tuple having the values, 'red', 'suv', 'Domestic' for the attributes color, type and origin. Compute a Naive Bayesian classification of the class stolen.

No.	Color	Type	Origin	Stolen?
1	Red	Sports	Domestic	Yes
2	Red	Sports	Domestic	No
3	Red	Sports	Domestic	Yes
4	Yellow	Sports	Domestic	No
5	Yellow	Sports	Imported	Yes
6	Yellow	SUV	Imported	No
7	Yellow	SUV	Imported	Yes
8	Yellow	SUV	Domestic	No
9	Red	SUV	Imported	No
10	Red	Sports	Imported	Yes

c) Explain star schema with example.

d) Explain K-means clustering algorithm.

e) Write a note on non linear regression.

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[5540]-21

M.Sc. (Computer Science) (Semester - II)
CS-201 : ADVANCED NETWORKING CONCEPTS
(2008 Pattern)

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

Instructions to the candidates :
1)   *All questions are compulsory.*
2)   *Draw a neat diagram wherever necessary.*
3)   *Figures to the right indicate full marks.*

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

  a)   Define the concept of networking and state its two applications.

  b)   What are the objectives of Network architecture?

  c)   What is datagram?

  d)   What is Bootstrap protocol?

  e)   What is router? And state its function.

  f)   What do you mean by process-to-process communication?

  g)   What is Domain Name and label?

  h)   What is client-server model?

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

  a)   Explain Silly window syndrome.

  b)   What is BGP? How BGP works in an autonomous system?

  c)   Describe how autoconfiguration of host is done in DHCP.

  d)   Describe IPV4 header with datagram.

  e)   Explain the procedure of CSMA/CA.

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

   a)   How switched WAN technology differ from LAN technology?

   b)   Why the datagram need to be fragmented?

   c)   Discuss dynamic address allocation of DHCP.

   d)   How RIP implements distance vector routing?

   e)   Define Marshaling and Remote procedure call with diagram.

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

   a)   What is cryptography? Explain its key element with diagram.

   b)   Explain the characteristics of mobile IP.

   c)   State the use of SNMP. What are the basic ideas on which SNMP
        management is based?

   d)   Explain Application - level gateway firewall.

   e)   What are the four aspects of registration in mobile IP?

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

   a)   Explain e-mail architecture.

   b)   Explain the purpose of sequence no. and acknowledge no. in TCP.

   c)   What is the difference between physical address and logical address?

   d)   Compare distance vector routing with link state routing.

   e)   How digital signature provides authentication, integrity and non-repudiation
        for message?

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[5540]-22

M.Sc. - I (Computer Science) (Semester - II)

CS-202 : UNIX INTERNALS

(2008 Pattern)

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

Instructions to the candidates :

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

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

a) Write any two features of UNIX operating system.

b) What is an inode?

c) What are the different status of buffer?

d) Write any two difference between Name and unnamed pipes.

e) Give the components of register context in brief.

f) Define PCB.

g) Comment : "No process can preempt another process executing in the kernel".

h) List the data structures used in demand paging.

Q2) State whether the following statements are true or false. Justify your answer (any four) [4 × 4 = 16]

a) Dup system call is used to maintain duplicate file descriptor.

b) The set uID function is used to set real user id.

c) Kernel keeps the inode locked across the execution of system call.

d) At the kernel level support for protected process is two fold.

e) A process sleeping and waiting for completion of disk I/O has a higher priority than a process waiting for free buffer.

Q3) Attempt any four of the following :   [4 × 4 = 16]
    a)   Explain deadlock scenario for link ( ).
    b)   Write a short note on context of process.
    c)   Explain fork( ) and vfork ( ) system call.
    d)   Briefly explain driver interfaces.
    e)   What is a process scheduling? Briefly explain scheduling policy.

Q4) Attempt any four of the following :   [4 × 4 = 16]
    a)   Write a 'C' programm to illustrate time system call.
    b)   Write a 'C' programm to explain in it system call.
    c)   Write a 'C' programm to read date from standard input and write it directly to user defined file.
    d)   Explain structure of regular file.
    e)   Explain behaviour of following 'C' programm.

```
void print_chars(int n, char c)
{
 int i;
 for( i = 0; i<n; i++)
 {
  char *s;
  int j;
  S = calloc(i+2, 1);
  of (1, S)
  {
   Perror("calloc");
    break;
  }
 for (j=0; j<i + 1 ; j++)
 {
 S[j] = c;
  }
 Print f("%s/n",s);
 free(s);
 }
}
```

        (consider n = 7 & c is %*)

[5540]-22   2

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

    a)   Explain in brief how to change size of process.

    b)   Briefly explain Layout of system memory.

    c)   Write the mode constraints for chmod functions.

    d)   Write a short note on disk driver.

    e)   Explain architecture of UNIX operating system.

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[5540]-23

M.Sc. (Computer Science)
CS-203 : Software Architecture
(2008 Pattern) (Semester - II)

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.*
4) *Neat diagrams must be drawn whenever necessary.*
5) *Assume suitable data, if necessary.*

Q1) Attempt <u>all</u> of the following. **[8 × 2 = 16]**

a) What are the three ways to apply UML?

b) "Software architecture manifests the earliest set of design decisions" Justify.

c) State any two questions used while approaching specific architectural style.

d) What is Design Pattern?

e) When singleton pattern method is used?

f) What do you mean by Low coupling GRASP?

g) Define framework.

h) "Components works as units of deployment" Justify.

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

a) What are the benefits of iterative development?

b) What is the need of validator framework?

c) Explain how pattern and software architecture is related.

d) Write a short note on Repositories.

e) Draw neat diagram of functional application tiers.

Q3) Attempt <u>any four</u> of the following :   [4 × 4 = 16]
   a)   Write a short note on pipe & filters.
   b)   State the different advantages of components.
   c)   Explain controller GRASP.
   d)   Explain Baracudda framework.
   e)   What are the types of responsibilities?

Q4) Attempt <u>any four</u> of the following :   [4 × 4 = 16]
   a)   What are UP disciplines?
   b)   State the characteristics of framework.
   c)   "Using protected variations GRASP, new implementations can be introduced without affecting clients". Justify.
   d)   What are different elements of design pattern?
   e)   Credit card company want to send bills to its customer for monthly transaction. A bill generator module should allow user to generate different types of bills for silver card, gold card, and platinum card. Selection of type of bill is based on card type and month.

   A new bill is generated by creating it. Bill generator module make necessary additions and probably print or email it.

   Select most appropriate design pattern to address the problem and how it is applied. Give an appropriate class diagram containing relevant classes to illustrate use of design pattern.

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

   a)   With the help of suitable example explain creator of GRASP.

   b)   Differentiate code reuse & component reuse.

   c)   State and explain the scope of resources defined by struts application.

   d)   State the properties of patterns for software architecture.

   e)   Write a short note on Homogeneous Architectures.

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[5540]-301

M.Sc. (Computer Science) (Semester - III)
CS : - 301 : Software metrics And Project Management
(2011 Pattern)

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 do you mean by project plan?

     b)   Define scope statement.

     c)   What is project cost management?

     d)   What is statistical sampling in quality management?

     e)   Define :

         i)   Measurement

         ii)   Bug

     f)   What is CMM?

     g)   List the phases of project life cycle.

     h)   What is change control board?

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

     a)   Explain overview of project in detail.

     b)   Describe project execution tools and techniques.

     c)   Describe any two project selection methods.

     d)   Define cost estimates? Explain types of cost estimates.

     e)   Explain in detail Resource leveling and resource loading.

*P.T.O.*

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

    a)   Write a short note on performance reporting.

    b)   Explain in detail TSP.

    c)   Write steps involved in planning of Data collection.

    d)   Discuss the reasons of failure of IT project.

    e)   Compare software reliability and Hardware reliability.

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

    a)   Explain different types of contracts.

    b)   Explain in detail how to use deceision tree in risk management.

    c)   Explain roles and responsibilities of measurement team?

    d)   Write a short note on GQM.

    e)   Define critical path And determine the critical path for the following.
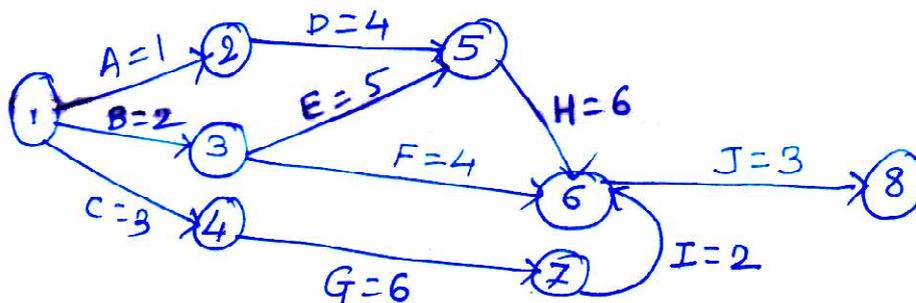
Q5) Attempt any four of the following :   **[4 × 4 = 16]**

    a)   Explain project integration management.

    b)   Write short note on triple constraint.

    c)   Explain various approaches to Developing WBS.

    d)   What are three main categories of output of quality control.

    e)   Write a note on Bohem software quality model.

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[5540]-302
M.Sc. (Semester - III)
COMPUTER SCIENCE
CS - 302 : Mobile Computing
(2011 Pattern)

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

Instructions to the candidates :

1) All questions are compulsory.

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 of the following :   **[8 × 2 = 16]**

a) What is spread spectrum?

b) What is Encapsulation?

c) Explain HLR.

d) Define User Mobility and Device Portability.

e) Explain hidden and exposed terminals.

f) List any two advantages of I-TCP.

g) What is the use of Control Channel (CCH)?

h) What is Hard handover?

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

a) What could be quick solutions? Why don't they work of Mobile IP?

b) Discuss the advantages and disadvantages of cellular system.

c) Compare in between SDMA and TDMA.

d) How registration of Mobile node does occur? Explain.

e) Discuss the working of snooping TCP with its advantages and disadvantages.

P.T.O.

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

    a)   Explain GPRS Architecture.

    b)   Explain Mobile terminated call with neat diagram in GSM.

    c)   List and explain the task of RNC in UMTS.

    d)   Explain MMS Architecture.

    e)   Explain the purpose of AUC (Authentication Centre) in GSM.

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

    a)   Explain Wireless Control Message Protocol.

    b)   Explain the three classes of transaction service used on WTP.

    c)   Explain Push Access Protocol.

    d)   What is Android OS? Explain its architecture.

    e)   Explain different layouts in Android.

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

    a)   Explain J2ME Architecture in details

    b)   Explain different scenarios of Handover in GSM

    c)   Explain SM MT and SM MO

    d)   Explain Destination Sequence Distance Vector (DSDV)

    e)   Explain Transaction Oriented TCP

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[5540]-303

M.Sc. (Semester - III)
COMPUTER SCIENCE
CS 303 : Soft Computing
(2011 Pattern)

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.*
4) *All questions carry equal marks.*
5) *Use of electronic pocket calculator is allowed.*

Q1) Attempt all :

[8 × 2 = 16]

a) State any two strengths of GA.

b) Explain the linguistic hedge - Intensification.

c) State the equation of Gaussian membership function.

d) Define fuzzy set.

e) State any two basic operations in GA.

f) What is supervised learning?

g) State the components of a neural network.

h) Consider two given Fuzzy sets

$$A_\sim = \left\{ \frac{1}{2} + \frac{0.3}{4} + \frac{0.5}{6} + \frac{0.2}{8} \right\}$$

$$B_\sim = \left\{ \frac{0.5}{2} + \frac{0.4}{4} + \frac{0.1}{6} + \frac{1}{8} \right\}$$

Perform union and complement over fuzzy set $A_\sim$ & $B_\sim$

P.T.O.

Q2) Attempt any four : [4 × 4 = 16]

    a)   What is defuzzification? Explain the weighted average and mean-max membership methods for defuzzifying fuzzy output.

    b)   Explain the features of membership function.

    c)   Explain disadvantages and advantages of GA.

    d)   Write short note on steepest Descent search.

    e)   Explain binary neuron structure in detail.

Q3) Attempt any four : [4 × 4 = 16]

    a)   Given the following 2 sets

$$W_1 = \left\{ \frac{1}{1.0} + \frac{0.75}{1.5} + \frac{0.3}{2.0} + \frac{0.15}{2.5} + \frac{0}{3.0} \right\}$$

$$W_2 = \left\{ \frac{1}{1.0} + \frac{0.6}{1.5} + \frac{0.2}{2.0} + \frac{0.1}{2.5} + \frac{0}{3.0} \right\}$$

       find i) $W_2 | W_1$

           ii) $\overline{W_1 \cup W_2}$

    b)   For the following fuzzy relation R find

       λ-cut relation for λ = 0.7 and λ = 0.3

$$R = \begin{array}{c} \\ y_1 \\ y_2 \\ y_3 \\ y_4 \end{array} \begin{array}{cccc} y_1 & y_2 & y_3 & y_4 \\ \begin{bmatrix} 1 & 0.8 & 0.4 & 0.2 \\ 0.8 & 1 & 0.3 & 0.1 \\ 0.4 & 0.3 & 1 & 0.2 \\ 0.2 & 0.1 & 0.2 & 1 \end{bmatrix} \end{array}$$

    c)   Given the following fuzzy numbers I & J using zaden's extension principle calculate fuzzy number "Approximately 24". is the resulting set convex.

$$I = \text{approx } 4 = \left\{ \frac{0.6}{3} + \frac{1}{4} + \frac{0.5}{5} \right\}$$

$$J = \text{approx } 6 = \left\{ \frac{0.2}{4} + \frac{0.4}{5} + \frac{1}{6} + \frac{0.6}{7} + \frac{0.3}{8} \right\}$$

d) Determine the preposition "If K then M" for the fuzzy sets given

$$K = \left\{ \frac{0}{q} + \frac{0.2}{p} + \frac{1}{r} + \frac{1}{s} \right\} \quad M = \left\{ \frac{0}{l} + \frac{0.3}{m} + \frac{0.8}{n} + \frac{1}{t} \right\}$$

e) Given the following 2 fuzzy sets :

$$A = \left\{ \frac{0}{4.5} + \frac{0.6}{4.7} + \frac{0.8}{5.0} + \frac{1}{6.0} \right\} \quad B = \left\{ \frac{0.5}{2.2} + \frac{0.8}{2.8} + \frac{1}{3.6} \right\}$$

Assume A is about Brightness and B is about darkness. Find the membership function for

i) not very bright & very dark

ii) not very dark but not bright

Q4) Attempt any two :   **[2 × 8 = 16]**

a) Explain any 2 properties of neural network. Explain what is unsupervised learning.

b) Define linear separability and show that the 2D boolean function XOR is linearly non-separable.

c) Let X = {X$_1$, X$_2$, X$_3$}, Y = {Y$_1$, Y$_2$, Y$_3$} and Z = {Z$_1$, Z$_2$, Z$_3$} be the universeal discourse on which the following fuzzy sets be defined

$$A = \left\{ \frac{0.1}{x_1} + \frac{0.9}{x_2} + \frac{0.3}{x_3} \right\} \quad B = \left\{ \frac{0.4}{y_1} + \frac{1}{y_2} + \frac{0}{y_3} \right\}$$

$$C = \left\{ \frac{0.3}{z_1} + \frac{1.0}{z_2} + \frac{0.2}{z_3} \right\}$$

Find   i)   A × B = R

ii)   S = B × C

iii) T = RoS using min-max composition

iv) U = R • S

Q5) Attempt any two : **[2 × 8 = 16]**

a) Simulate the execution of perception learning algorithm for each epoch on following inputs, (1, 1, 1) (1, 1, −1) (1, 0, −1) (−1, 1, 1) (−1, 1, −1) (−1, 1, −1) (−1, 0, −1) with weight vector (0, 0, 1) η = 1. What is final weight vector?

b) Let x = {a, b, c, d} & y = {1, 2, 3, 4} &

Let $A = \left\{ \dfrac{0.2}{a} + \dfrac{0.8}{b} + \dfrac{0.6}{c} + \dfrac{0.2}{d} \right\}$

$B = \left\{ \dfrac{0.3}{1} + \dfrac{0.7}{2} + \dfrac{1}{3} + \dfrac{0.1}{4} \right\}$

$C = \left\{ \dfrac{0}{1} + \dfrac{0.6}{2} + \dfrac{1}{3} + \dfrac{0.6}{4} \right\}$

Determine implication relations

i) If x is in A then y is in B

ii) If x is in A then y is in B else y is in C

c) Explain basic genetic algorithm.

Maximize $f(x) = 2x + 1$ over {0, 1, 2, 3, ...31} with

initial x values of (10, 22, 9, 13).

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[5540]-31

M.Sc. (Computer Science) (Semester - III)

CS-301 : SOFTWARE METRICS & PROJECT MANAGEMENT

(2008 Pattern)

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 the following.　　　　　　　　　　　　　　　**[8 × 2 = 16]**

　　a)　Define project charter.

　　b)　State the purpose of statement of work.

　　c)　What is Earned value Analysis.

　　d)　List the contents of Risk Register.

　　e)　What are types of Risks?

　　f)　Define CPI & SPI.

　　g)　What is work Authorization system?

　　h)　What is CMM?

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

　　a)　Explain WBS with an example.

　　b)　Explain in detail project scope statement.

　　c)　What are MC - call quality facters?

　　d)　What are cost estimation tools & techniques?

　　e)　What is project plan? How it is executed in companies?

P.T.O.

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

   a)   Write a note on solicitation planning.

   b)   What is software reliablity? How it can be measure?

   c)   What are different types of power in human Resource Management?

   d)   Write a short note on cost budgeting.

   e)   What are roles & responsibilities of measurement team?

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

   a)   What are elements of project integration management.

   b)   Write a note on internal & external attributes.

   c)   Discuss in brief communication planning.

   d)   Write a note on configuration management.

   e)   Explain Scope management in detail.

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

   a)   Explain organization structure in detail.

   b)   Write a note on GGM framework.

   c)   What are qualities of project manager?

   d)   Write a short note on TSP.

   e)   What are types of contract?

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[5540]-32

M.Sc. (Computer Science) (Semester - III)
CS-302 : MOBILE COMPUTING
(2008 Pattern)

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 the question.   **[8 × 2 = 16]**

   a)   List any four J2ME profile.

   b)   What is Time division duplex?

   c)   What are the functions of Gateway GSM in GPRS?

   d)   What is COA?

   e)   Explain RTT problem in GSM.

   f)   What are the advantages of FHSS over DSSS?

   g)   What are configuration parameters for TCP?

   h)   What is near & far terminal problem?

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

   a)   Compare Text Box Control & Text field control.

   b)   Explain in detail the use of snooping in TCP.

   c)   Explain architecture of GSM in detail.

   d)   Write a short note on Push Access Protocol.

   e)   What are goals of Mobile IP? Explain requirements of Mobile IP.

P.T.O.

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

    a)   Write note on Network MID lets?

    b)   Explain Cellular IP with its advantages & disadvantages.

    c)   Explain WAP architecture.

    d)   Give comparison of Proactive protocols & reactive protocols in mobile ad-hoc network.

    e)   Explain Packet Reservation Multiple Access (PRMA) Scheme.

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

    a)   Explain the roles of various entities in mobile IP.

    b)   Explain the changes needed in TCP in 2.5 G/3G networks.

    c)   How localization is achieved in GSM?

    d)   What are the different types of commands does J2ME supports?

    e)   What are different classes of Wireless Transaction Protocol (WTP).

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

    a)   Explain functionality of WTLs.

    b)   Write a note on CDMA.

    c)   What are the effects of mobility on traditional TCP?

    d)   What is frequency hopping? Explain its advantage and disadvantages.

    e)   Explain spread spectures mechanism.

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[5540]-33

M.Sc. (Computer Science) (Semester - III)
CS-303 : INFORMATION SYSTEMS SECURITY
(2008 Pattern)

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

Instructions to the candidates :

1) *All questions are compulsory.*
2) *All questions carry equal marks.*
3) *Neat diagrams must be drawn wherever necessary.*

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

a) Define :

   i)   Release of message contents

   ii)   Traffic analysis

b) Convert the plain text "To develop attitude & interest along with necessary knowledge" by applying Rail Fence technique.

c) Define - Self signed digital certificate.

d) Define - stegnography.

e) Justify True/False : Passive attacks are difficult to detect.

f) Explain model of network security.

g) How challenge response tokens are used for authentication.

h) State script based approach to achieve SSO.

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

a) Explain RSA encryption process with example.

b) How subkeys are generated in blowfish algorithm?

c) Explain working of MD5.

d) Apply play fair cipher on plain text "My college" & use keyword as "systems".

e) How SSL achives confidentiality & integrity?

P.T.O.

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

   a)   How firewall perform network address translation?

   b)   What is message digest? Explain the key requirements at message digest.

   c)   Explain working of secure hash algorithm.

   d)   Why digital certificate revocation is needed? How online certificate revocation status check is done?

   e)   How does password based authentication works?

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

   a)   Explain the working at RC5.

   b)   Discuss different steps used for every round of AES.

   c)   What is SET? Explain operation of SET.

   d)   What is VPN? Explain it's architecture.

   e)   What are typical contents of a digital certificate.

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

   a)   Explain the working of kerberos.

   b)   Explain objectives of SSL.

   c)   Explain different steps for every round of ZDEA.

   d)   What is horeypot? Explain different types of it.

   e)   Discuss AH and ESP.

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