

Total No. of Questions : 5]

SEAT No. :

P1634

[Total No. of Pages : 2

[5440]-102
M.Sc. (Semester - I)
COMPUTER SCIENCE
CS - 102 : Advanced Networking
(2011 Pattern)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

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

Q1) Attempt all of the following :

[8 × 2 = 16]

- a) State any two problems that occur with password based authentication.
- b) What is certificate based authentication?
- c) State any two advantages of SET.
- d) Define any two contents of digital certificate.
- e) Explain the role of public key and private key in digital signature.
- f) What is VPN?
- g) Define symmetric key algorithm and state the two examples of symmetric key algorithm.
- h) Define the role of port address in transport layer.

Q2) Attempt any four from the following :

[4 × 4 = 16]

- a) Explain the basic functionalities of an IP router.
- b) Write a note on ICMP messages.
- c) Define Multiplexing. What is the need of multiplexing in transport layer?
- d) State any four applications of multimedia.
- e) Explain substitution cipher technique with example.

P.T.O.

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

- a) With example explain how encryption works.
- b) Why there is a need of SSL?
- c) What is passive attack? Explain two types of attack.
- d) Differentiate between IPV4 and IPV6.
- e) Explain silly window syndrome in TCP.

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

- a) What is routing and routing table?
- b) Explain any two connecting devices of networks.
- c) How authentication works using Kerberos?
- d) Write a note on Voice over IP.
- e) What is Ethernet? Define the two categories of traditional Ethernet.

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

- a) Explain RSA algorithm.
- b) How digital certificate issued?
- c) What is Electronic money? Explain its types.
- d) How packet forwarding takes place?
- e) What is cryptography? What are its requirements?



Total No. of Questions : 5]

SEAT No. :

P1624

[Total No. of Pages : 3

[5440] - 11
M.Sc. (Semester - I)
COMPUTER SCIENCE
CS - 101: Principles of Programming Languages
(2008 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) *Assume suitable data, if necessary.*

Q1) Attempt any Eight of the following:

[8 × 2 = 16]

- a) What is "this" pointer in C++?
- b) Differentiate between compiler and Interpreter.
- c) Give use of following LISP predicates:
 - i) equal
 - ii) eq
- d) What is elaboration and referencing environment?
- e) What are constructors and destructors?
- f) Explain fail predicate in prolog.
- g) What is coroutine? How does it differ from a subroutine?
- h) "The limited dynamic string of C and C++ do not require runtime descriptor." Justify true / false.
- i) What is an Associative array?
- j) Explain the concept of boxing in Java.

Q2) Attempt any four of the following:

[4 × 4 = 16]

- a) Explain the classification of programming languages.
- b) What is dangling reference? Explain with example how dangling reference is created in C language.
- c) Explain how shared multiple inheritance is implemented with suitable example.
- d) Write a short note on generic subprogram. Also give example of it in C++.

P.T.O.

e) Consider the following pseudocode:

```
a : integer      -- global
procedure set_a (n: integer)
    a := n
procedure print_a
    write_integer(a)
procedure one
    Set_a (1)
    print_a
procedure two
    a : integer
    set_a (2)
    print_a
set_a (0)
one ( )
print_a
two ( )
print_a
```

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

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

- a) Explain Applicative order evaluation and normal order evaluation.
- b) What is a descriptor? Give descriptor for static string & limited dynamic string.
- c) Explain any two parameter passing modes with suitable example.
- d) What is monitor? Write advantages of monitor over semaphore.
- e) Explain different times at which binding decisions can be made.

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

- a) What are eight major categories of control flow mechanism?
- b) Explain :
 - i) Competition synchronization
 - ii) Co-operative synchronization
- c) What is nesting of classes in Java? Explain with suitable example.
- d) Explain various categories of arrays based on binding of subscript range and storage.
- e) What is an abstract class in C++? Explain how Vtable is maintained in single inheritance.

Q5) Attempt any four of the following:

[4 × 4 = 16]

- a) Define a recursive LISP function to find union of two lists taken as arguments.
- b) Write a recursive LISP function to display the length of a list taken as argument.
- c) Write a prolog program to demonstrate the use of green cut.
- d) Write a prolog program to find the addition of first 'n' number.
- e) Consider the following sentences:

"All cats likes to eat all types of fish. All calico are cats. All tuna are fish. Charlie is tuna. Tomy is tuna. Puss is calico". Write a prolog program to answer the question, "What does puss likes to eat?" Show how it will be answered by your program.



Total No. of Questions : 4]

SEAT No. :

P1625

[Total No. of Pages : 2

[5440] - 12
M.Sc. (Semester - I)
COMPUTER SCIENCE
CS- 102 : Object Oriented Software Engineering
(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) Explain stereotypes with example.
- b) Define
 - i) Realization
 - ii) Generalization
- c) Define model and state its advantages.
- d) Explain composition relationship with example.
- e) Explain qualifier with example.
- f) What is note?
- g) What is Beta test?
- h) What is test case?

Q2) Attempt any four.

[4 × 4 = 16]

- a) Explain various artifacts in Inception phase.
- b) Draw a sequence diagram for online examination system.
- c) Explain various features of object oriented with example.
- d) Write a note object oriented analysis method.
- e) Describe various views in UML.

P.T.O.

Q3) Attempt any four.

[4 × 8 = 32]

- a) Draw a class diagram and usecase diagram for placement agency.
- b) Draw a collaboration diagram for banking transactions.
- c) Write note on
 - i) Component diagram
 - ii) Deployment diagram
- d) Consider the case Mr. X. gives a telephonic call to Mr. Y. consider various scenarios and draw continuous state chart diagram for telephone object.
- e) Draw an activity diagram and object diagram for 'www.amazon.com.'

Q4) Attempt any four.

[4 × 4 = 16]

- a) Write note on object oriented design method.
- b) Explain various types of testing.
- c) Write a note on generic components of OO design model.
- d) Write a short note on constraints.
- e) How usecase model help in analysis phase from Inception to elaboration?



Total No. of Questions : 5]

SEAT No. :

P1626

[Total No. of Pages : 4

[5440] - 13
M.Sc. (Semester - I)
COMPUTER SCIENCE
CS- 103 : Distributed Database Concepts
(2008 & 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 should be drawn whenever necessary.*

Q1) Attempt any eight of the following.

[8 × 2 = 16]

- a) What are the four criteria based on which distributed computing system is classified?
- b) Define
 - i) Unilingual MDDBS
 - ii) Multilingual MDDBS
- c) What are the steps involved in query decomposition?
- d) Define-
 - i) Bushy tree
 - ii) Linear tree
- e) What are different ways of fragmenting a relation?
- f) Give any two situations that may occur if proper isolation of transactions is not maintained.
- g) Define
 - i) Mutual consistent state
 - ii) Recoverable DB
- h) What are different types of failures that can occur in Distributed environment?
 - i) Define -
 - i) Conjunctive normal form
 - ii) Disjunctive normal form
- j) What is full reducer?

P.T.O.

Q2) Answer any four of the following. **[4 × 4 = 16]**

- a) Explain with diagram "Top-down" approach of DDBMS design.
- b) Explain in brief four properties of query processor which are applicable only to distributed query processor.
- c) Differentiate between in- place update and out - of - place update recovery.
- d) Explain the process of query optimization.
- e) Explain different levels of transparencies supported by DDBMS.

Q3) Solve any four of the following. **[4 × 4 = 16]**

- a) Let $Q = \{q_1, q_2, q_3\}$ be the set of queries.
 $A = \{A_1, A_2, A_3\}$ be the set of attributes, with A_1 as primary key.
 $S = \{S_1, S_2\}$ be the sites where queries are executed. Using the following attribute usage values and access frequencies, construct attribute affinity and clustered affinity matrices.

$\begin{matrix} & A_1 & A_2 & A_3 \\ q_1 & \begin{bmatrix} 1 & 1 & 0 \end{bmatrix} \\ q_2 & \begin{bmatrix} 0 & 1 & 0 \end{bmatrix} \\ q_3 & \begin{bmatrix} 1 & 0 & 1 \end{bmatrix} \end{matrix}$	$\begin{matrix} & S_1 & S_2 \\ q_1 & \begin{bmatrix} 40 & 2 \end{bmatrix} \\ q_2 & \begin{bmatrix} 30 & 10 \end{bmatrix} \\ q_3 & \begin{bmatrix} 0 & 25 \end{bmatrix} \end{matrix}$
Usage Matrix	Access frequencies

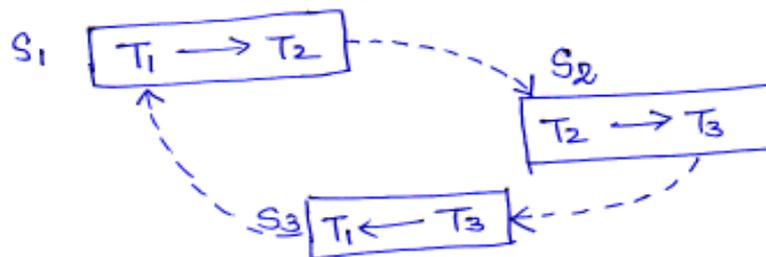
- b) Suppose there are two relations EMP and PAY and they are horizontally fragmented as

$$EMP_1 = \sigma_{age \geq 25 \wedge age < 40} (EMP)$$

$$EMP_2 = \sigma_{age \geq 40} (EMP)$$

$$PAY_1 = \sigma_{Sal \geq 100000} (PAY)$$

$$PAY_2 = \sigma_{Sal < 100000} (PAY)$$
 Draw a join graph of $EMP \bowtie PAY$. Is the graph simple? If not how to make it simple?
- c) Consider the following distributed wait-for-graph. Detect the deadlock if any using distributed deadlock detection algorithm.



- d) Consider the relations.
 Emp (Eno, Ename, Designation, Age, Pno) Proj (Pno, Pname, location, Budget)
 Apply INGRES algorithm to the following query and illustrate successive detachment and substitutions by giving mono-relational queries.

```

Select Ename
From Emp, Proj
Where Emp, Pno = Proj, Pno
and Designation = "Manager"
and Budget > 500000
  
```

- e) Consider a data items X and Y, with
 RTS (X) = 3, WTS (X) = 3
 RTS (Y) = 6, WTS (X) = 4
 Let the pair $\langle R_i(X), T_s \rangle$ denotes read request of transaction T_i with timestamp TS on data item X and the pair $\langle W_i(X), T_s \rangle$ denotes write request of transaction T_i with time stamp T_s on dataitem X. Indicate the behaviour of the basic timestamp method with following sequence of request.

$\langle R_3(X), 5 \rangle, \langle R_4(Y), 7 \rangle \langle R_5(X), 8 \rangle$
 $\langle W_3(X), 5 \rangle, \langle R_3(Y), 5 \rangle \langle W_5(X), 8 \rangle$

Q4) Attempt any four of the following.

[4 × 4 = 16]

- Write note on "peer - to - peer" architecture.
- What are types of transaction based on
 - duration of transaction
 - organization of read and write operations
- Explain primary copy 2PL by showing how the messages are transferred?
- Assume that PROJ relation is horizontally fragmented as

$$\text{PROJ}_1 = \sigma_{\text{dno} \leq 10} (\text{PROJ})$$

$$\text{PROJ}_2 = \sigma_{\text{dno} > 10 \wedge \text{dno} < 20} (\text{PROJ})$$

$$\text{PROJ}_3 = \sigma_{\text{dno} > 20} (\text{PROJ})$$

Draw an optimized operator tree for the following query, convert it to generic tree and then reduce it by considering fragmentation information.

```

Select Ename
From PROJ, EMP
Where PROJ, Pno = EMP, Pno
and PROJ, Pno < 7
  
```

- What is No - fix / flush decision? Explain the behaviour of abort, commit and recover under this decision strategy.

Q5) Attempt any four of the following.

[4 × 4 = 16]

- a) With a proper diagram explain message transfer that takes place in 2 phase commit protocol.
- b) Discuss deadlock avoidance algorithms in DDBMS
- c) What are the rules for checking the correctness of fragmentation? Discuss the correctness rules with respect to primary horizontal fragmentation.
- d) List all the eight characteristics of query processor and explain any one in details.
- e) Write note on
 - Optimistic concurrency control protocol.



Total No. of Questions : 5]

SEAT No. :

P1627

[Total No. of Pages : 3

[5440] - 14
M.Sc. (Semester - I)
COMPUTER SCIENCE
CS- 104 : Design & Analysis of Algorithms
(2008 & 2011 Pattern)

Time :3 hours]

[Max. Marks :80

Instructions to the candidates:

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

Q1) Attempt any Eight from the following.

[8 × 2 = 16]

- a) What are the limitations of merge sort?
- b) Justify $4n^2 + 3n + 2 = O(n^2)$
- c) State Cook's theorem.
- d) Give the control abstraction of Greedy algorithm.
- e) Define Horner's rule.
- f) What is longest common subsequence problem?
- g) Define Tree edge and Back edge. Give one example.
- h) What are implicit and explicit constraints for backtracking?
- i) What do you mean by branch and bound? Give an example of an application where this technique might be useful?
- j) What is Towers of Hanoi Problem? Give its computing time in terms of recurrence relation.

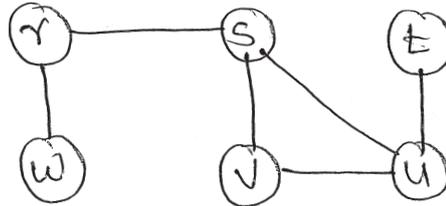
Q2) Attempt any four of the following.

[4 × 4 = 16]

- a) Why quick sort is also called as partition or exchange sort? Determine running time of quick sort for.
 - i) Sorted input
 - ii) Reverse ordered input
 - iii) Random input
- b) Order the following functions in ascending order of their growth rates and justify 2^n , n^2 , $\log n$, n^3 , n , $n \log n$

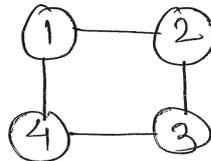
P.T.O.

- c) Find an optimal solution to the knapsack instance $n = 7, m = 15$
 $(P_1, P_2, \dots, P_7) = (10, 5, 15, 7, 6, 18, 3)$
 $(W_1, W_2, \dots, W_7) = (2, 3, 5, 7, 1, 4, 1)$
- d) Find the minimum cost of computing product of chain of matrices having dimensions $20 \times 5, 5 \times 10, 10 \times 10, 10 \times 5$ using dynamic programming.
- e) Explain BFS method for a graph and draw BFS tree for G by starting at vertex S.

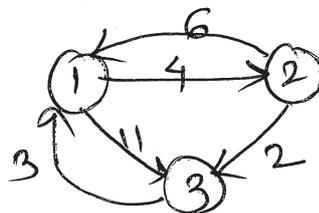


Q3) Attempt any four of the following. [4 × 4 = 16]

- a) Write an algorithm findmax to find maximum number from A array. Also find step count for findmax.
- b) Write non - deterministic algorithm to sort set of n positive integers.
- c) Find out all possible solutions for the following graph coloring problem with $m = 3$. Also show that only 12 solutions exist with exactly 3 colors.



- d) Draw the portion of state space tree generated by LCBB for the knapsack problem with fixed tuple where
 $W = (2, 4, 6, 9)$ $P = (10, 10, 12, 18)$ $n = 4, m = 15$
- e) Find all pairs shortest path for the following graph using dynamic programming.



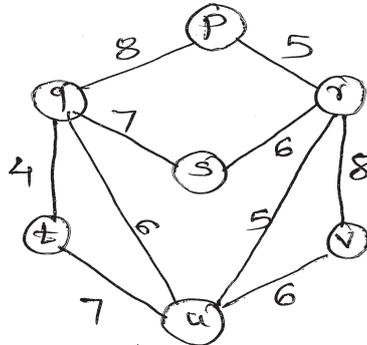
Q4) Attempt any two of the following. [2 × 8 = 16]

- a) What is string editing. Given sequences $x = a a b a b$ and $y = b a b b$. Find an edit sequence of minimum cost which transforms x into y . The cost of each insertion and deletion is 1 and cost of changing is 2.

- b) What is sum of subset problem? Find out the solution for sum of subsets using fixed tuple size state space tree.

$$n = 5 \quad m = 30 \quad w = \{5, 7, 10, 13, 15\}$$

- c) What is minimum spanning tree. Apply prim's & kruskal's algorithm to obtain minimum spanning tree for the following graph.



Q5) Attempt any two of the following.

[2 × 8 = 16]

- a) Obtain the reduced cost matrix for the TSP instance given by the cost matrix

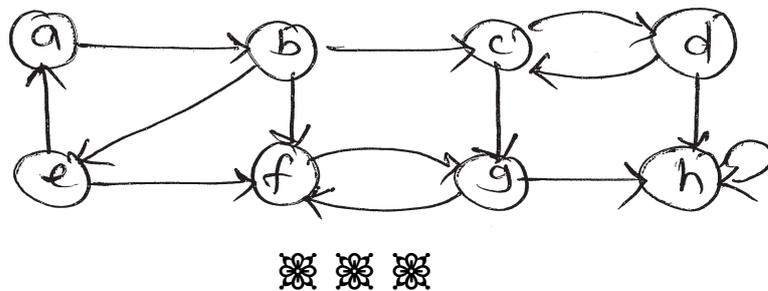
$$\begin{bmatrix} \infty & 20 & 30 & 10 \\ 15 & \infty & 16 & 4 \\ 3 & 5 & \infty & 2 \\ 19 & 6 & 18 & \infty \end{bmatrix}$$

- b) Explain strassen's matrix multiplication. Derive the time complexity required by strassen's matrix multiplication. Compute the matrix product of following matrices giving each computational steps.

$$A = \begin{bmatrix} 4 & 3 \\ 5 & 6 \end{bmatrix} \quad B = \begin{bmatrix} 3 & -2 \\ -4 & 2 \end{bmatrix}$$

- c) What is strongly connected components of a directed graph. Write algorithm for finding strongly connected graph? Find strongly connected components of following graph G using the algorithm.

(Start Vertex C)



Total No. of Questions : 8]

SEAT No. :

P1635

[Total No. of Pages : 3

[5440]-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) What is smoothing?
- b) What is structuring element? Draw any two standard shapes.
- c) Calculate the memory required to store a black and white image with 256 gray levels and 1024×1024 resolutions.
- d) State any two methods of generating signatures.
- e) Define digital Image.
- f) Define the city block distance between pixels 'p' and 'q' of an image.
- g) Define linear and non-linear operation in Digital Image Processing.
- h) What is the difference between an edge and a boundary?

Q2) a) Explain Erosion and Dilation with the help of diagrams, show that erosion and Dilation are duals of each other. [8]

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

c) Write equations for obtaining 2D forward and inverse DFT. Give meaning of each variable in the equation. [4]

P.T.O.

- Q3)** a) Give three different ways of acquiring image and explain any one in detail. Mention an application of each method. [8]
 b) Explain the process of harmonic filtering. Mention it's application. [4]
 c) Give the orientation of the lines which will be detected using following four mask. [4]

-1	-1	-1
2	2	2
-1	-1	-1

2	-1	-1
-1	2	-1
-1	-1	2

-1	2	-1
-1	2	-1
-1	2	-1

-1	-1	2
-1	2	-1
2	-1	-1

- Q4)** a) Write a short note on Ideal High Pass filter. Butterworth High Pass Filter. [8]
 b) What are the fundamental steps in edge detection. [4]
 c) What is 'Gamma Correction'? How is it implemented using power law transformation. [4]

- Q5)** a) What is the use of 'Hit - or - Miss' transformation? Explain the morphological operations involved in this transformation using suitable diagram. [8]
 b) Give any two probability distribution and mention their sources. [4]
 c) Write a short note on log transformation. [4]

- Q6)** a) Describe the fundamental steps in digital image processing with the help of a block diagram. [8]
 b) Explain bit plane slicing. [4]
 c) Define mixed adjacency. Explain how it eliminates ambiguity that often arises with 8 - adjacency. [4]

- Q7)** a) Define 'Opening' and 'closing' operation. In what way do they differ from each other. [8]
 b) Explain what is meant by unsharp masking and highboost filtering. [4]
 c) One dimensional image strip represented by {1 2 5 9 4 3} is to be convolved with a filter kernel given by {-1 0 1}. Give the step-by-step procedure of finding the answer. [4]

- Q8) a)** A 32×32 pixel image has intensity distribution as shown in the table given below. The intensity levels are in the range 0.7. Apply histogram equalization technique and find the transfer function that relates output image. Intensity level S_k with input image intensity level V_k . [8]

Intensity level	No. of Pixels
$V_0 = 0$	211
$V_1 = 1$	344
$V_2 = 2$	103
$V_3 = 3$	127
$V_4 = 4$	76
$V_5 = 5$	57
$V_6 = 6$	47
$V_7 = 7$	59

- b) Write the iterative algorithm for global thresholding. [4]
- c) Write a short note on contrast stretching. [4]



Total No. of Questions : 5]

SEAT No. :

P1636

[Total No. of Pages : 4

[5440]-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) *Assume suitable data if necessary.*
- 5) *Figures to the right indicate full marks.*

Q1) Attempt all of the following :

[8 × 2 = 16]

- a) What is processor execution level? What is its use?
- b) What is table of contents?
- c) What is the use of last parameter in open ()?
- d) Write psuedo code for context switch.
- e) Differentiate malloc () and alloca ().
- f) What is reentrant function?
- g) What data structure are associated with processes and threads in windows?
- h) Which two CPU numbers are associated with threads in windows?

Q2) State whether the following statements are true or false. Justify (any eight) :

[8 × 2 = 16]

- a) At the Kernel level, support for protected process is two fold.
- b) In linux the files are usually accessed via file names.
- c) Symbolic links incur more overhead than hard links.
- d) Kernel keeps the inode locked across the execution of the system call.
- e) We can set only one of the two times values with the utime function.
- f) No process can preempt another process executing in the Kernel.
- g) Kernel allows context switch only when process is about to go to sleep.
- h) Signal system call is used to send signal to a process.
- i) A process sleeping and waiting for completion of disk I/O has a higher priority than a process waiting for the free buffer.

P.T.O.

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

- a) Explain thread scheduling scenarios in windows operating system.
- b) What do you mean by unreliable signals?
- c) Explain structure of executive thread block and kernel thread block.
- d) Discuss various anomalies in the treatment of signals.
- e) Write in brief about memory alignment.

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

- a) Explain the behaviour of following 'C' program.

```
Void exit_handler 1 () : exit_handler 2 ();
int main ()
{
int pid;
at exit (exit_handler 1);
at exit (exit_handler 2);
pid = fork ();
if (pid == 0)
_exit (0);
else
{
Sleep (2);
exit (0);
}
return 0;
}
void exit_handler 1 ()
{
Printf ("one Exit");
}
Void exit_handler 2 ()
{
printf ("Two exit");
}
```

- b) Explain the behaviour of 'C' program.

```
# include <fcntl.h>
main ()
{
int uid, euid, fdmjb, fdmaury;
uid = getuid ();
euid = geteuid ();
```

```

printf ("uid = % d euid = %d", euid, euid);
fdmjb = open ("mjb", O_RDONLY);
printf ("fdmjb = % d fdmaury = %d", fdmjb,
        fdmaury);

setuid (uid);
printf ("after setuid (%d) : uid = %d
        euid = % d ln", uid, getuid (), geteuid ());
setuid (euid);
printf ("after setuid (%d) : uid = %d
        euid = % d ln", euid, getuid (),
        geteuid ());
}

```

- c) Explain the behaviour of the following program

```

#include <signal.h>
sigcatcher ()
{
Printf ("PID = % d Caught one ln", getpid ());
signal (SIGINT, Sigcatcher);
}
main ()
{
int pid;
Signal (SIGINT, Sigcatcher);
if (fork () = = 0)
{
Sleep (5);
ppid = getppid ();
for (; ;)
if (Kill (ppid, SIGINT) = = -1)
exit ();
}
nice (10);
for (; ;)
}

```

- d) Explain the behaviour of following program.

```

main ()
{
Char * endpt;
Char * sbrk;

```

```

int brk ( );
endpt = sbrk (0);
Printf (“endpt = % ud after sbrk ln”, (int) endpt);
while (endpt --)
{
if (brk (endpt == -1))
{
Printf (“brk of % ud failed ln”, endpt);
exit ( );
}
}
}

```

- e) Explain the behaviour of following program.

```

main ( )
{
int f;
char s [1024];
f = creat (“sample.dat”, 0666);
lseek (f, 2000 L, 2);
write (f, “hello world”, 11);
Close (f);
f = open (“sample . dat”, O_RDONLY);
read (f, s, 1024);
read (f, s, 1024);
read (f, s, 1024);
}

```

Q5) Attempt any four of the following :

[4 × 4 = 16]

- Write a C program where parent and child share file access.
- 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 the same file write the string “UNIX”.
- Write a C program to read data from standard input and write it directly to user defined file.
- Write a C program to demonstrate Race condition in catching signals.
- Write a C program to illustrate use of Vfork function.
- Write a C program to catch user defined signals.



Total No. of Questions : 5]

SEAT No. :

P1637

[Total No. of Pages : 3

[5440]-203

M.Sc. (Semester - II)

COMPUTER SCIENCE

CS - 203 : Data Mining and Data Warehousing

(2011 Pattern)

Time : 3 Hours]

[Max. Marks :80

Instructions to the candidates:

- 1) *All 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) What is a data mart?
- b) List steps of KDD process.
- c) Give an example of time series analysis.
- d) List out two steps of association rule mining.
- e) What is sensitivity and specificity of a classifier?
- f) List out the two steps of data classification.
- g) What is a crawler?
- h) What is the formula of Bayes theorem?
- i) What is a cluster?
- j) What is concept hierarchy?

Q2) Attempt any four of the following :

[4 × 4 = 16]

- a) Define support and confidence in Association rule mining. What is the purpose of Apriori algorithm?
- b) How missing values are handled in data warehouse?
- c) Write a note on Decision tree induction.
- d) Explain Architecture of Data warehouse.
- e) Write a note on web structure mining.

P.T.O.

Q3) Attempt any two of the following :

[2 × 8 = 16]

- a) The following table contains training data from 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

- b) The following table shows the midterm and final exam marks obtained for students in a database. Use the method of least squares to find an equation for the prediction of a students final exam marks on the students midterm marks in the course. Predict the final exam marks of a student who received 86 marks in the midterm exam.

Midterm Exam	Final Exam
72	84
74	78
59	49
33	52
50	63
94	90
83	79
88	74
81	77
86	75
65	77
81	90

- c) Suppose that the data mining task is to cluster points (with (x, y) representing location) into three clusters, where the points are $A_1 (2, 10)$, $A_2 (2, 5)$, $A_3 (8, 4)$, $B_1 (5, 8)$, $B_2 (7, 5)$, $B_3 (6, 4)$, $C_1 (1, 2)$, $C_2 (4, 9)$. The distance function is Euclidean function. Suppose initially we assign A_1 , B_1 and C_1 as the center of each cluster respectively. Use the k-means algorithm to show:
- the three cluster centers after the first round of execution.
 - the final three clusters.

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

- Differentiate between Agglomerative and Divisive hierarchical clustering algorithm.
- Why naive Bayesian classification is called naive? Briefly outline the major ideas of Naive Bayesian classification.
- Explain following accuracy measures :
 - Bootstrap
 - Cross-validation
- Differentiate between Text mining and web mining.
- How to handle noisy data?

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

- Generate frequent itemsets 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

- Name different attribute selection methods in decision tree induction. Explain any one in detail.
- What are the advantages of having a data warehouse.
- Explain data mining issues.
- Explain basic data mining tasks of predictive model.



Total No. of Questions : 5]

SEAT No. :

P1628

[Total No. of Pages : 2

[5440] - 21
M.Sc. (Semester - II)
COMPUTER SCIENCE
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) What is protocol? State its elements.
- b) Define any two functions of physical layer.
- c) What is ICMP? and state its two categories of messages.
- d) Define LAN and Ethernet.
- e) Define Unicast address.
- f) What are the service primitives of transport layer?
- g) What are the port-numbers of FTP for data connection and control connection?
- h) Which protocol works for connection - oriented application and for connection - less application?

Q2) Attempt any four of the following.

[4 × 4 = 16]

- a) Explain how TCP controls congestion?
- b) What is OSPF? How OSPF works in an autonomous system?
- c) Describe the operation of BOOTP protocol.
- d) Why is there a restriction on the generation of an ICMP message in response to a failed ICMP error message?
- e) Explain IEEE802.11 FHSS and DSSS.

P.T.O.

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

- a) What are the advantages of frame relay over $\times.25$?
- b) What are basic requirement of an Internet? Discuss these requirement with reference to an IP.
- c) Explain any four BOOTP message format.
- d) Explain the concept and need of metric in network.
- e) Explain the fields of user datagram format.

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

- a) What is VPN? How does it differ from traditional network?
- b) Write a note on agent discovery.
- c) How to use metafile for accessing audio, video files from the server?
- d) Discuss authentication using shared secret key.
- e) How data transfer takes place in mobile IP?

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

- a) How Telnet allows a user to log on to remote machine?
- b) Why application would use UDP instead of TCP?
- c) Explain various techniques used in point to point WAN to establish connection between two devices.
- d) What is multi casting? How IGMP works in multi casting?
- e) Why is it necessary to translate Network address?



Total No. of Questions : 5]

SEAT No. :

P1629

[Total No. of Pages : 3

[5440]-22

M.Sc. - I (Semester - II)
COMPUTER SCIENCE
CS - 202 : Unix Internals
(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 whenever necessary.*
- 4) *Figures to the right indicate full marks.*
- 5) *Assume suitable data, if necessary.*

Q1) Attempt all of the following :

[8 × 2 = 16]

- a) Write any four inode operations.
- b) What is buffer pool?
- c) What is Unnamed pipe?
- d) What are different states of process?
- e) What is init process?
- f) List any four functions of clock interrupt handler.
- g) Explain file truncation.
- h) Comment process 0 and process 1 exists through a life time of a system.

Q2) State whether the following statements are true or false. Justify your answer (any four) :

[4 × 4 = 16]

- a) Terminal state of process denotes that process has finished its execution.
- b) The kernel releases the inode while unmounting the file system.
- c) Shell is an interface between user and operating system.
- d) Open operation will fail if an attempt is made for creating a file which already exists.
- e) Idle process means its pid 0.

P.T.O.

Q3) Attempt any four of the following :

[4 × 4 = 16]

- a) Explain UNIX system architecture.
- b) Explain scenario for retrieval of buffer.
- c) Explain read and write operations of pipes.
- d) How to save context of process in UNIX?
- e) Explain create () system call in detail.

Q4) Attempt any four of the following :

[4 × 4 = 16]

- a) Write a 'C' program to allow random access to a file.
- b) Write a 'C' program to explain sleep () in detail.
- c) Write a 'C' program to illustrate use of time system call.
- d) Write a 'C' program that change a size of process.
- e) Explain the behaviour of following 'C' program.

```
Void Print - chars (int n, char c)
{
int i;
for (i = 0; i < n ; i ++ )
{
char *P
int K;
P = calloc (i + 2, 1)
if (1, p)
{
perror ("calloc");
break;
}
for (k = 0 ; K < i ; k ++ )
S [K] = C;
Printf ("% sin", P) ;
free (p);
}
(consider n = 8 & cis*)
```

Q5) Attempt any four of the following :

[4 × 4 = 16]

- a) Under which circumstances the process is swapped out.
- b) What are the reasons for creating a process in UNIX?
- c) Explain unlink file system call in brief.
- d) Explain process states with neat diagram.
- e) Write a short note on disk driver.



Total No. of Questions : 5]

SEAT No. :

P1630

[Total No. of Pages : 2

[5440]-23

M.Sc. (Semester - II)

COMPUTER SCIENCE

CS - 203 : Software Architecture

(2008 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 whenever necessary.
- 5) Assume suitable data, if necessary.

Q1) Attempt all of the following :

[8 × 2 = 16]

- a) What is UML?
- b) State any one reason why software architecture is important.
- c) Define Architectural styles.
- d) What is Pattern?
- e) What are different forms of coupling?
- f) What are the types of responsibilities?
- g) Write the characteristics of framework.
- h) Define component.

Q2) Attempt any four of the following :

[4 × 4 = 16]

- a) Explain with example how to select specific architectural style.
- b) What are the varying degrees of functional cohesion?
- c) Explain with example the advantages of components.
- d) What are the duties performed by MVC model and MVC view in a web Tier Application?
- e) Viewers evaluate contestants in a singing competition on voice quality attributes by rating them. Evaluation data updates as more and more viewers evaluate online. The result is displayed in variety of display formats including bar chart, pie chart and tabular form.
Select the most appropriate design pattern to use to address the problem and how it is applied give an appropriate class diagram containing relevant classes to illustrate use of the pattern.

P.T.O.

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

- a) Explain component Reuse.
- b) Explain the criterias to classify design pattern.
- c) Write short note on Homogeneous Architectures.
- d) What are protected variations of GRASP?
- e) State and explain scope of resources defined by struts application.

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

- a) Explain Decorator design pattern with scope, purpose, Intent, Applicability and structure.
- b) Write a short note on Layered systems.
- c) Write advantages of struts.
- d) What are different elements of design pattern?
- e) Explain framework lifecycle.

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

- a) Write a short note on controller GRASP.
- b) What do you mean by critical UP practices?
- c) Explain cocoon framework.
- d) What are the different pattern categories?
- e) A simple struts application is to be designed, which represents a home page of Trip agency which prompts for booking a bus ticket. On clicking booking link page asks for source and destination of journey. When page is submitted an index page displays a list of buses with their details.

Give the struts components one need to create while designing the application.



Total No. of Questions : 5]

SEAT No. :

P1638

[Total No. of Pages : 2

[5440]-301

M.Sc. (Semester - III)

COMPUTER SCIENCE

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) List the qualities required for project manager.
- b) What is metric plan?
- c) Define MTTF and MTBF.
- d) State major processes involved in HRM.
- e) Define activity on Arrow.
- f) What is Risk identification?
- g) State tools and techniques used in quality assurance.
- h) What is CMM?

Q2) Attempt any four of the following :

[4 × 4 = 16]

- a) What is project? Discuss important attributes of project.
- b) State purpose of project charter with example.
- c) Explain the 'where and when' of metrics plan.
- d) Write a note on GQM.
- e) Discuss the role of communication management in Project.

P.T.O.

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

- a) Explain McCall's software quality model in detail.
- b) Differentiate between software reliability and Hardware reliability.
- c) Discuss major problems faced in estimation of cost of IT project.
- d) What are the different aspects of size in measuring internal project attribute of software metrics?
- e) Explain critical path Analysis method.

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

- a) What are the different types of power used in Human Resource Management.
- b) Define
 - i) EVA
 - ii) SV
 - iii) CV
 - iv) CPI
- c) Explain in brief levels of process maturity.
- d) Project manager tries to reduce high staff turnover Justify.
- e) Explain solicitation and what is solicitation planning?

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

- a) Describe project execution tools & techniques.
- b) Explain the different categories of Risk.
- c) Write a short note on scope statement.
- d) What are the main outputs of closing project in project integration management.
- e) Discuss various types of contracts.



Total No. of Questions : 5]

SEAT No. :

P1639

[Total No. of Pages : 2

[5440]-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) Define short term fading.
- b) Explain VLR.
- c) Discuss near and Far Terminals
- d) Define multi path Propagation.
- e) Compare CO-COA and FA-COA.
- f) List any two disadvantages of snooping TCP.
- g) What is Dummy Burst ?
- h) What is Soft hand over?

Q2) Attempt any four of the following :

[4 × 4 = 16]

- a) What is Mobile Computing? Discuss its Applications.
- b) Discuss the Direct Sequence Spread Spectrum (DSSS).
- c) Compare in between TDMA and FDMA.
- d) Explain and list the problems related with Reverse Tunneling.
- e) Explain the working of M-TCP.

P.T.O.

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

- a) What are various strengths of SMS? Explain.
- b) Explain GSM system architecture.
- c) Explain Mobile Originated call with neat diagram in GSM.
- d) What is the difference between GPS and GPRS?
- e) Explain IPv6 in Mobile IP.

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

- a) Explain UTRAN.
- b) Explain the Components of WAP Architecture.
- c) What is WTLS? Explain the services offered by it.
- d) Discuss the features of Android.
- e) Explain event Handling in Android.

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

- a) Differentiate CLDC and CDC
- b) How registration of mobile node does occur? Explain with diagram.
- c) Explain the mechanism of Dynamic source routing
- d) Discuss lifecycle and activities of Android.
- e) Explain the purpose of AUC (Authentication Centre) in GSM.



Total No. of Questions : 5]

SEAT No. :

P1640

[Total No. of Pages : 4

[5440]-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 basic operators in genetic algo.
- b) Find $A^c \cap B$ for the following 2 fuzzy sets

$$A = \left\{ \frac{0.1}{a} + \frac{0.5}{b} + \frac{1}{c} + \frac{0.6}{d} + \frac{0.2}{e} \right\}$$

$$B = \left\{ \frac{0.2}{a} + \frac{0.5}{b} + \frac{0.8}{c} + \frac{0.3}{d} + \frac{0.1}{e} \right\}$$

- c) Explain the linguistic hedge-dilation.
- d) Define what is Triangular membership function.
- e) Define convexfuzzy set.
- f) State any 2 applications of GA.
- g) What is perceptron learning Rule.
- h) State the components of a neural network.

P.T.O.

Q2) Attempt any four :

[4 × 4 = 16]

- What is defuzzification? Explain the centroid and weighted average methods.
- Explain concept of convex fuzzy sets. What is fuzzy number.
- Explain any four properties of GA.
- Briefly outline the procedure of gradient descent based learning.
- State the important properties of TLN'S.

Q3) Attempt any four :

[4 × 4 = 16]

- Given the following two fuzzy sets.

$$\tilde{A} = \left\{ \frac{0.2}{A} + \frac{0.6}{B} + \frac{1}{C} + \frac{0.8}{D} + \frac{0.4}{E} \right\}$$

$$\tilde{B} = \left\{ \frac{0.3}{B} + \frac{1}{C} + \frac{0.6}{D} + \frac{0.3}{E} \right\}$$

Find

- $\tilde{B} | \tilde{A}$
 - $\overline{\tilde{A} \cap \tilde{B}}$
- For the following fuzzy relation \tilde{R} , find the λ -cut relation for $\lambda_{0.8}$, $\lambda_{0.4}$, $\lambda_{6.5}$, λ_1 .

$$\tilde{R} = \begin{matrix} & \begin{matrix} a & b & c & d \end{matrix} \\ \begin{matrix} a \\ b \\ c \\ d \end{matrix} & \begin{bmatrix} 1 & 0.3 & 0.6 & 0.8 \\ 0.3 & 1 & 0.2 & 0.7 \\ 0.6 & 0.2 & 1 & 0.2 \\ 0.8 & 0.7 & 0.2 & 1 \end{bmatrix} \end{matrix}$$

- Given the following fuzzy number \tilde{P} and \tilde{Q} , using zadeh's extension principle calculate fuzzy number "approximately 18". What can you say about the resulting set?

$$\tilde{P} = \text{approx } \tilde{3} = \left\{ \frac{0}{a} + \frac{0.4}{b} + \frac{0.8}{c} + \frac{1}{d} \right\}$$

$$\tilde{Q} = \text{approx } \tilde{6} = \left\{ \frac{0.3}{e} + \frac{0.7}{f} + \frac{1}{g} + \frac{0.8}{h} \right\}$$

- d) Determine the proposition “If L then M” for the fuzzy sets given

$$\underline{\tilde{L}} = \left\{ \frac{0.8}{a} + \frac{1}{b} + \frac{0.6}{c} \right\} \quad \underline{\tilde{M}} = \left\{ \frac{1}{d} + \frac{0.4}{e} + \frac{0.2}{f} \right\}$$

- e) Given the following two fuzzy sets.

$$\text{Cold} = \underline{\tilde{C}} = \left\{ \frac{0}{a} + \frac{0.2}{b} + \frac{0.5}{c} + \frac{0.8}{d} + \frac{1}{e} \right\}$$

$$\text{Hot} = \underline{\tilde{H}} = \left\{ \frac{1}{a} + \frac{0.9}{b} + \frac{0.5}{c} + \frac{0.3}{d} + \frac{0}{e} \right\}$$

Find membership functions for

- i) Not very cold $\underline{\tilde{C}}$ & not very hot $\underline{\tilde{H}}$
- ii) Slightly cold $\underline{\tilde{C}}$ or not hot $\underline{\tilde{H}}$

Q4) Attempt any two :

[2 × 8 = 16]

- a) Explain any two properties of neural network. Write any two difference between supervised and unsupervised learning.
- b) Define linear separability and show that the 2D Boolean function ‘OR’ is linearly separable.
- c) Let $X = \{x_1, x_2, x_3\}$, $Y = \{y_1, y_2, y_3\}$, $Z = \{z_1, z_2, z_3\}$ be the universe of discourse on which the following fuzzy sets are defined respectively.

$$\underline{\tilde{P}} = \left\{ \frac{0.4}{x_1} + \frac{0.8}{x_2} + \frac{1}{x_3} \right\} \quad \underline{\tilde{Q}} = \left\{ \frac{0.2}{y_1} + \frac{0.6}{y_2} + \frac{1}{y_3} + \frac{0.8}{y_4} \right\}$$

$$\underline{\tilde{R}} = \left\{ \frac{0.6}{z_1} + \frac{1}{z_2} + \frac{0.8}{z_3} + \frac{0.3}{z_4} \right\}$$

Find

- i) $\underline{\tilde{S}} = \underline{\tilde{P}} \times \underline{\tilde{Q}}$
- ii) $\underline{\tilde{T}} = \underline{\tilde{Q}} \times \underline{\tilde{C}}$
- iii) $\underline{\tilde{U}}^1 = \underline{\tilde{S}} \circ \underline{\tilde{T}}$
- iv) $\underline{\tilde{V}}^1 = \underline{\tilde{S}} \cdot \underline{\tilde{T}}$

Q5) Attempt any two :

[2 × 8 = 16]

- a) Simulate the execution of perceptron learning algorithm for each epoch on given inputs -

(1, 1, 1) (1, 1, -1) (1, 0, -1) (-1, 1, 1) (-1, 1, 1) (-1, 0, -1) with weight vector (0, 1, 0) and $\eta = 1$. What is final weight vector.

- b) Let $X = \{1, 2, 3, 4\}$ and $Y = \{a, b, c, d\}$ &

$$\text{Let } \underline{L} = \left\{ \frac{0.1}{1} + \frac{0.7}{2} + \frac{0.5}{3} + \frac{1}{4} \right\}$$

$$\underline{M} = \left\{ \frac{0.3}{a} + \frac{1}{b} + \frac{0.8}{c} + \frac{0}{d} \right\}$$

$$\underline{N} = \left\{ \frac{0}{a} + \frac{.5}{b} + \frac{1}{c} + \frac{0.7}{d} \right\}$$

Determine the implication relations

- i) If x is in L then y is in M
- ii) If x is in \underline{L} then y is in \underline{M} else y is in \underline{N} .
- c) Explain the basic genetic algorithm, Maximize $F(x) = 2x$ over $\{0, 1, 2, 3, \dots, 31\}$ with initial x values of (12, 23, 8, 16).



Total No. of Questions : 5]

SEAT No. :

P1631

[Total No. of Pages : 2

[5440]-31

M.Sc. (Semester - III)

COMPUTER SCIENCE

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 direct cost and intangible cost.
- b) Define fault and failure in software.
- c) State any two difference between AOA & PDM.
- d) What is importance of Delphi technique?
- e) Define Resource Loading.
- f) Define terms.
 - i) Risk factor
 - ii) Risk event
- g) What are different aspects of size?
- h) Define following terms.
 - i) MTTF
 - ii) MTBF

Q2) Attempt any four of the following :

[4 × 4 = 16]

- a) Write a note on :
 - i) Gantt chart
 - ii) PERT chart
- b) Explain COCOMO model in brief.
- c) What is CCB? How change control board used in IT projects?
- d) What is software reliability? How it can be measured?
- e) Explain tools & techniques of schedule development process of project time management.

P.T.O.

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

- a) What are steps involved in planning of data collection?
- b) Define Risk identification. What are categories of Risk?
- c) Describe project execution tools & techniques.
- d) Write a short note on PSP.
- e) Explain in detail project charter statement.

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

- a) Write a note on internal & external attribute.
- b) What are different methods of selecting projects in IT project management.
- c) Explain Maslow's theory in Human Resource Management.
- d) What are tools & techniques used in quality assurance?
- e) Illustrate software reliability growth problem.

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

- a) Explain any four activities involved in S/W measurement.
- b) What are tools used in activity sequencing in schedule management?
- c) Explain in brief : Levels of process maturity.
- d) What are advantages of good project management?
- e) Which are dependencies among project activities?



Total No. of Questions : 5]

SEAT No. :

P1632

[Total No. of Pages : 2

[5440]-32

M.Sc. (Semester - III)

COMPUTER SCIENCE

CS - 302 : Mobile Computing
(2008 Pattern) (Credit System)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) Attempt all the questions.
- 2) Figures to the right indicate full marks.

Q1) Attempt all the questions :

[8 × 2 = 16]

- a) What are the different types of bearer services in GSM?
- b) Compare HLR with VLR.
- c) What are the purpose of display class in J2ME?
- d) What are the types of COA?
- e) Define mobile communication.
- f) What do you mean by mobility & device portability.
- g) What is the difference between CLCD & CDC?
- h) What is uplink & downlink?

Q2) Attempt any four :

[4 × 4 = 16]

- a) What are the constraints possible on Text Box in J2ME.
- b) Write note on alternative metrics.
- c) Explain how T-TCP reduces standard TCP overhead.
- d) Write a note on MACA.
- e) How GPRS implements different quality of services?

Q3) Attempt any four :

[4 × 4 = 16]

- a) Write a short note on radio subsystem of GSM.
- b) Compare between FDMA & TDMA.
- c) Explain J2ME architecture.
- d) Write a note on cellular system.
- e) How inefficient triangular routing problem is handled in Mobile IP.

P.T.O.

Q4) Attempt any four :

[4 × 4 = 16]

- a) What is the need of mobile ad-hoc network?
- b) What are various components & interfaces of WAP architecture?
- c) Write a note on agent discovery in mobile IP.
- d) What are the different types of services defined in GSM.
- e) What are important features of windows CE & Symbian operating system?

Q5) Attempt any four :

[4 × 4 = 16]

- a) With respect to routing, how wired network differs from adhoc wireless network.
- b) What is the purpose of indirect TCP? Explain its advantages & disadvantages.
- c) Explain CDMA with its advantages & disadvantages.
- d) “J2ME is similar to J2SE”. True / False. Justify your answer.
- e) Explain DSSS & FHSS techniques of spreading spectrum in detail.



Total No. of Questions : 5]

SEAT No. :

P1633

[Total No. of Pages : 2

[5440]-33

M.Sc. (Semester - III)

COMPUTER SCIENCE

CS - 23 - 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) What is authentication? List the different types of authentication.
- b) What is access control? How different it is from availability?
- c) What is steganography?
- d) What is honey pot?
- e) What is roaming certificate?
- f) What is meant by delta-CRL?
- g) What is the purpose of SSL alert protocol?
- h) In MD5 if length of the message is 5120 bits, how many bits are required for padding?

Q2) Attempt any four of the following :

[4 × 4 = 16]

- a) Discuss the concept of phishing & pharming.
- b) Explain how subkeys are generated in Blowfish algorithm.
- c) Explain the encryption process of RC5.
- d) Explain Digital Envelopes and Digital signature
- e) Explain the PGP security mechanisms in detail.

P.T.O.

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

- a) What is a firewall? Briefly explain its types.
- b) Explain Kerberos.
- c) List the steps involved in working of MD5. Explain process blocks in detail.
- d) Arya meets Riya and says zewfidrkzfejpjkvd.jjvtlizxp. If she is using modified ceaser ciphar, What does she want to convey?
- e) What is the real crux of RSA?

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

- a) Explain the process of SET protocol to protect credit card transaction on the Internet.
- b) A & B wants to establish a secret Key using Deffie Hellman key exchange protocol. Assuming the values are $n = 17$, $g = 13$, $x = 4$ and $y = 6$. Find values of A, B, K_1 and K_2 .
- c) Discuss the different types of intruders. Explain any one intrusion detection mechanism.
- d) Explain IDEA briefly.
- e) Explain message digest. What are the key requirements of message digest?

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

- a) Given two prime numbers $P = 17$ and $Q = 23$. Find out N, E and D in an RSA encryption process.
- b) What is buffer overflow? List the four buffer overflow vulnerabilities in the SSL handshakes.
- c) When is Demilitarized zone required? How is it implemented?
- d) Explain the different steps used in one time initialization process of AES.
- e) Discuss the various steps used in verification of digital certificate.

