

Total No. of Questions :8]

SEAT No. :

P2276

[Total No. of Pages :3

[5333] - 1001

M.Sc. (Computer Science)

CS - 101 : PRINCIPLES OF PROGRAMMING LANGUAGES

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) Attempt any Five Questions.*
- 2) Draw a diagram wherever necessary.*
- 3) Figures to the right indicate full marks.*
- 4) Assume suitable data if necessary.*

Q1) Attempt the following:

- a) What are the programming language spectrum. [4]
- b) Explain the differences between compilation and interpretation. [4]
- c) Define prolog and states which are 2 types of databases support it. [2]

Q2) Attempt the following:

- a) State the differences between CONS and Append primitives in LISP with example. [4]
- b) Explain garbage collection mechanism. [4]
- c) What is iterator? What are two programming languages that supports iterator. [2]

Q3) Attempt the following:

- a) Explain slice mechanism. [4]
- b) Discuss the design issues of subprograms. [4]
- c) What is overloaded subprogram? What are the programming languages which has predefined overloaded subprograms. [2]

P.T.O.

Q4) Attempt the following:

- a) Explain CUT predicate. Also explain how it is used in combination with FAIL predicate. [4]
- b) Explain the distinction between decision that are bound statically and those that are bound dynamically. [4]
- c) What is l-value? An r-value. [2]

Q5) Attempt the following:

- a) Explain tombstone mechanism. [4]
- b) Consider the following (erroneous) [4]

Program in C :

```
void foo( )
{
    int i ;
    printf(“%d,” i++) ;
}
main()
{
    int j ;
    for (j=1 ; j<=10 ; j++)
        foo() ;
}
```

Local variable i in a subroutine foo is never initialized. On many system however the program will display repeatable behaviour, printing 0123456789. Suggest an explanation. Also explain why the behaviour on the other system might be different on non deterministic.

- c) Define [2]
 - i) List in LISP
 - ii) Unification in PROLOG.

Q6) Attempt the following:

- a) Explain initialization and assignment in C++ with suitable example. [4]
- b) What is concurrency? Explain the categories of concurrency. [4]
- c) Define virtual and non-virtual methods. [2]

Q7) Attempt the following:

- a) Explain the connection between dynamic method binding and polymorphism. [5]
- b) Explain the differences between declarative languages and imperative languages and explain late binding. [5]

Q8) Attempt the following:

- a) Explain iteration and recursion with example. [5]
- b) Write C/C++ function that declares an array statically on the stack and on the heap. Explain which one is more efficient. [5]



Total No. of Questions : 8]

SEAT No. :

[Total No. of Pages : 3

P2277

[5333] - 1002

M.Sc.

COMPUTER SCIENCE

CS-102: Advanced Networking

(2013 Pattern) (Semester - I)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any five questions from given eight questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicates full marks.*

Q1) Attempt all of the following:

- a) What is email. Explain any one email security protocol. [4]
- b) Explain the structure of enter. [4]
- c) List the devices work in Layer-2 of TCP/IP network model. [2]

Q2) Attempt all of the following:

- a) Apply caesar cipher scheme to codify the message by replacing each alphabet with an alphabet two places down the line. Obtain the cipher text for the given plain text: 'ADVANCED NETWORKING'. [4]
- b) What is firewall? What are its advantages. [4]
- c) What is IV? [2]

Q3) Attempt all of the following:

- a) Explain UDP applications used for various tasks. [4]
- b) Explain in brief 802.11 architecture. [4]
- c) What is streaming stored videos. [2]

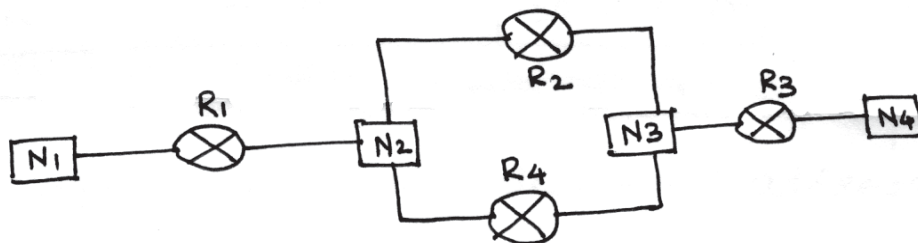
P.T.O.

Q4) Attempt all of the the following:

- a) Explain errors handled by ICMPv6. [4]
- b) How crash recovery is handled in transport layer. [4]
- c) What is DNS spoofing. [2]

Q5) Attempt all of the following:

- a) Explain the concept of voice over IP. [4]
- b) Show which router (s) sends out router link & network link LSAs in the following diagram. [4]



- c) Define plain text and cipher text. [2]

Q6) Attempt all of the following:

- a) Create public key & private key by applying RSA algorithm for $P = 11$ and $q = 23$. [4]
- b) Explain in brief: Virtual Private Network. [4]
- c) State the parties involved in Kerberos. [2]

Q7) Attempt all of the following:

- a) How Bellman-Ford algorithm is used to find shortest path. [5]
- b) Compare & contrast SSL & SET. [5]

Q8) Attempt all of the following:

a) Consider the following routing table for router R_1 .

[5]

Mask	Network Address	Next Hop	Interface
/26	180.70.165.192	-	M_2
/25	180.70.165.128	-	M_0
/24	201.4.22.0	-	M_3
/22	201.4.16.0	-	M_1
default	default	180.70.65.200	M_2

- i) Show the forwarding process if a packet arrives at R_1 with destination address 201.4.22.40.
- ii) Show the forwarding process if a packet arrives at R_1 with destination address 20.24.30.75.

b) Write a note on socket primitives used in Berkeley Unix.

[5]

EEE

Total No. of Questions : 8]

SEAT No :

P2278

[Total No. of Pages :4

[5333]-1003

M.Sc.

COMPUTER SCIENCE

CS-103 : Distributed Database Concepts

(2013 Pattern) (Semester-I)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any five out of the eight questions.*
- 2) *Draw neat diagrams wherever necessary.*
- 3) *All questions carry equal marks.*
- 4) *Assume suitable data if necessary.*

Q1) Answer the following:

- a) What are the complicating factors of DDBMS? [4]
- b) Write a note on DBMS standardization. [4]
- c) In components of DDBMS what is. [2]
 - i) Semantic data controller
 - ii) Local recovery manager.

Q2) Answer the following:

- a) Consider the tables [4]
Department (deptno, location, director).
Staff (staffnum, director, task)
There are several staff members for each department led by the departments' director.
STAFF has a horizontal fragmentation derived from DEPARTMENT and a semijoin on the 'director' attribute. Which assumption is required in order to assure completeness and disjointness?
- b) Define the following with an example of each [4]
 - i) Flat transaction
 - ii) Nested Transaction.

P.T.O.

- c) Draw the query graph for the following [2]
 Select ename, resp
 from employee e, project p, Asg a
 where e.eno=a.eno
 and p.pno=a.pno
 and p.pname = "vehicle management"
 and a.dur \geq 24

Q3) Answer the following :

- a) Let $Q = \{q_1, q_2, q_3\}$ be the set of queries, $A = \{A_1, A_2, A_3, A_4\}$ be the set of attributes and $S = \{S_1, S_2\}$ be the set of sites. The matrix a, given below, describes the attribute usage values and matrix b gives application access frequencies. Assume that $ref(q_k) = 1$ for all q_k . Apply clustering algorithm and obtain vertical partitions of the relation. [4]

$$a = \begin{matrix} & A_1 & A_2 & A_3 & A_4 \\ q_1 & \begin{bmatrix} 1 & 1 & 1 & 0 \end{bmatrix} \\ q_2 & \begin{bmatrix} 0 & 1 & 1 & 0 \end{bmatrix} \\ q_3 & \begin{bmatrix} 0 & 0 & 1 & 1 \end{bmatrix} \end{matrix}$$

(a)

$$b = \begin{matrix} & S_1 & S_2 \\ q_1 & \begin{bmatrix} 5 & 20 \end{bmatrix} \\ q_2 & \begin{bmatrix} 25 & 8 \end{bmatrix} \\ q_3 & \begin{bmatrix} 30 & 6 \end{bmatrix} \end{matrix}$$

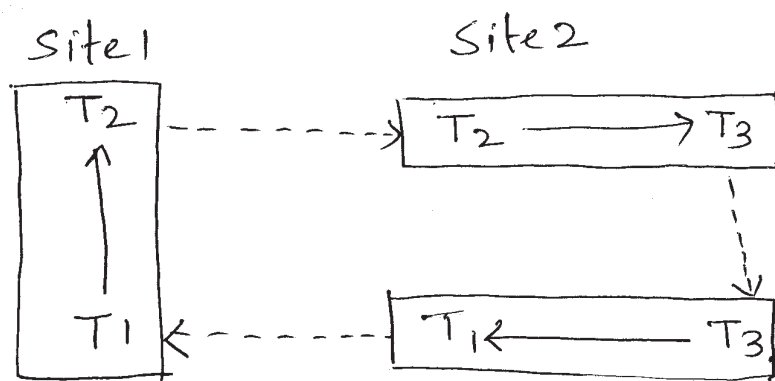
(b)

[4]

- b) Write a note of characterization of query processors. [4]
 c) State any two phenomena if proper isolation is not maintained. [2]

Q4) Answer the following :

- a) Consider the GWFG



Detect the deadlock using distributed deadlock detection and resolve the same.

- b) Consider the following relation.
 Class (Class-id, cname, total - strength)
 Let $P_1 : \text{total - strength} \leq 30$
 $P_2 : \text{total - strength} > 30$
 be two predicates defined on class. perform a horizontal fragmentation of class, based on $\{P_1, P_2\}$.
 Further consider the relation.
 Student (stud - id, name, class - id)
 Perform a derived horizontal fragmentation of student wrt the relation class. Draw join graph of student \bowtie class on class - id. [4]
- c) What do you mean by transactional workflows. [2]

Q5) Answer the following :

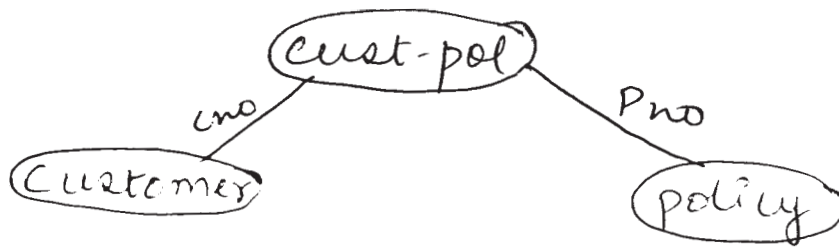
- a) Given the following relations
 Account (Ano, clientnumber, balance)
 Client (clientnumber, name, bdate, branch)
- i) formulate a query in SQL that prints the account numbers affiliated with 'Pune' branch whose balance is less than 5000.
 ii) Draw the operator tree and rewritten operator tree. [4]
- b) Consider a data item x , let $RTM(x) = 21$ and $WTM(x) = 20$; Let the pair $(\langle R_i(x), TS \rangle, \langle W_i(x), TS \rangle)$ denote a read |write request of transaction T_i on item x with timestamp TS . Indicate the behavior of basic timestamp method with following sequence of requests.
 $\langle R_1(x), 19 \rangle, \langle R_2(x), 22 \rangle, \langle W_3(x), 29 \rangle, \langle W_4(x), 23 \rangle, \langle R_5(x), 28 \rangle, \langle W_6(x), 27 \rangle$ [4]
- c) List any four types of failures that can occur in DDBMS [2]

Q6) Answer the following :

- a) How site failures are handled in 2 PC protocol if co-ordinator and participant fail? [4]
- b) Explain the interface between LRM and the buffer manager with diagram. [4]
- c) What is minterm selectivity? [2]

Q7) Answer the following :

- a) Explain centralized and primary copy 2PL. [5]
- b) Consider the join graph [5]



The fragmentation of the three relations is done and following table shows the number of tuples of each relation stored at three different sites S_1 , S_2 and S_3

	S_1	S_2	S_3
Customer	300	200	600
Policy	-	150	-
Cust-Pol	1500	700	-

Size (customer \bowtie cust-pol) = 2000

Size (Policy \bowtie cust - pol) = 4000

Apply algorithm of distributed ingres for point - to- point and broadcast networks so that the communication time is minimized.

Q8) Answer the following :

- a) Explain in place update and out of place update recovery. [5]
- b) Explain 3 phase comit protocol. [5]

M.Sc.

COMPUTER SCIENCE

CS - 104 : Design and Analysis of Algorithms
(2013 Pattern) (Semester - I)

Time : 3 Hours]

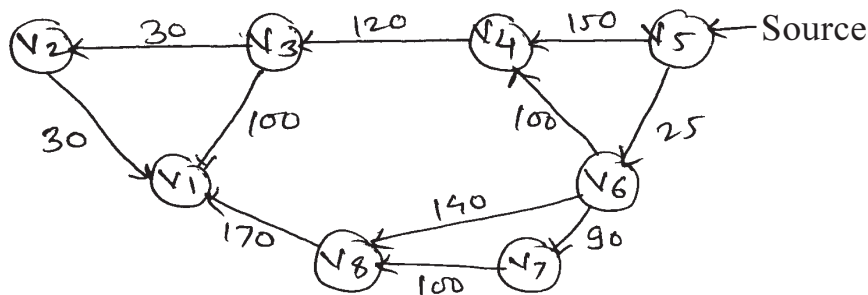
[Max. Marks : 50

Instructions to the candidates:

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

Q1) a) Write a selection sort algorithm and obtain it's best and worst case running time. [4]

b) Find shortest distance from given source to all destinations using Dijkstra's algorithm. [4]

[Source Vertex V_5]

c) Justify true or false [2]
 $n^n = O(2^n)$

Q2) a) Write an algorithm to find fast Fourier transform using divide and conquer strategy. [4]

b) Find an optimal solution for knapsack problem. [4]

$$n = 7 \quad p = (10, 5, 15, 7, 6, 18, 3)$$

$$m = 15 \quad w = (2, 3, 5, 7, 1, 4, 1)$$

c) What is Towers of Hanoi problem? Give it's computing time in terms of recurrence relation. [2]

P.T.O.

- Q3)** a) Obtain a set of optimal Huffman codes for the messages ($m_1, m_2, m_3, m_4, m_5, m_6, m_7$) with relative frequencies ($f_1, f_2, f_3, f_4, f_5, f_6, f_7$) = (1, 1, 2, 3, 5, 8, 13). Draw the decode tree for this set of codes. [4]
 b) Define P and Np class. State Cook's theorem and explain its significance. [4]
 c) Why least cost search method is preferred over LIFO and FIFO Branch and Bound Method? [2]

- Q4)** a) Solve the given instance of TSP by using reduced cost matrix method. [4]

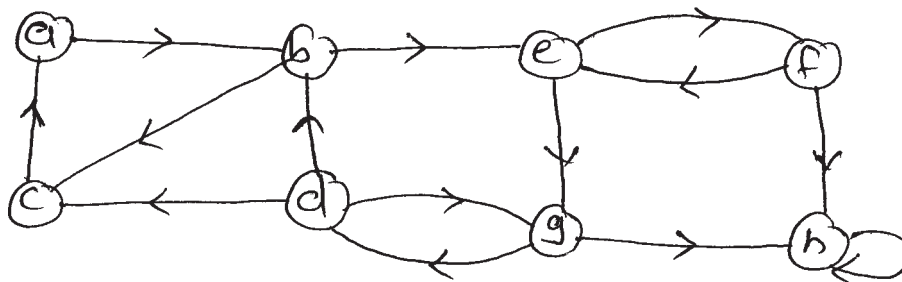
$$\begin{bmatrix} \infty & 20 & 30 & 10 & 11 \\ 15 & \infty & 16 & 4 & 2 \\ 3 & 5 & \infty & 2 & 4 \\ 19 & 6 & 18 & \infty & 3 \\ 16 & 4 & 7 & 16 & \infty \end{bmatrix}$$

- b) Show how merge sort algorithm sort the following sequences of keys 35, 20, 15, 8, 14, 40, 3, 50, 4. [4]
 c) Define Horner's rule. [2]

- Q5)** a) Consider the following instance for job sequencing with deadlines problem where $n = 5$
 (p_1, p_2, \dots, p_7) = (3, 5, 20, 18, 1, 6, 30)
 (d_1, d_2, \dots, d_7) = (1, 2, 4, 3, 2, 1, 2)
 Give solution obtained using greedy method that uses set representation. [4]

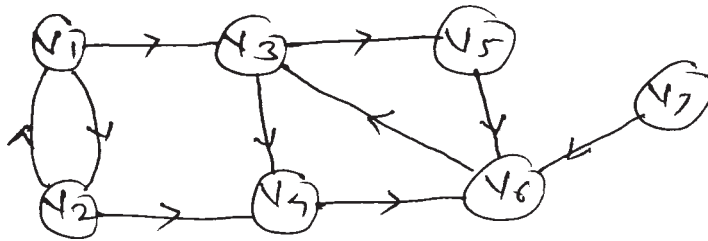
- b) Determine the polynomial of smallest degree that interpolates the points (0, 1), (1, 2) and (2, 3). [4]
 c) Define state space tree and a problem state. [2]

- Q6)** a) Explain DFS? Illustrate it on the following graph? List tree edge and back edge of the same start from vertex C. [4]

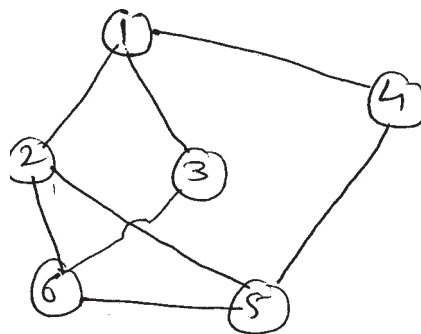


- b) Let $A[1 \dots n]$ be an array of integers, integers can be duplicated. Write an efficient algorithm to find occurrences of given integer in an array A find its time complexity. [4]
- c) Justify that partial solution obtained during kruskal's algorithm are also trees. [2]

- Q7)** a) Given sequences $x = a, a, b, a, b$ and $y = b, a, b, b$. Find an edit sequences of minimum cost which transforms x into y . The cost of each insertion and deletion is 1 and the cost of changing any symbol to any other symbol is 2. [5]
- b) Illustrate the strongly connected components algorithm on the following graph (start vertex V_1). [5]



- Q8)** a) Consider 0/1 knapsack problem with $n = 5$, $m = 12$, $p = (10, 15, 6, 8, 4)$, $w = (4, 6, 3, 4, 2)$ using dynamic programming. [Use function method] [5]
- b) What is m-colorability graph? Draw all Hamiltonian cycle for the following graph. [5]



Total No. of Questions :8]

SEAT No. :

P2280

[5333]-1005

[Total No. of Pages : 2

M.S.c.

COMPUTER SCIENCE

**CS-105 : Network Programming
(2013 Pattern) (Semester-I)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) Attempt all of the following :

- a) Explain Day time client and Day time server with one example each. [4]
- b) Explain socket function with one example. [4]
- c) Explain inet_pton. [2]

Q2) Attempt all of the following :

- a) Discuss the server termination process. [4]
- b) How to handle the lack of flow control with UDP client server communication. [4]
- c) Define protocol Registration process. [2]

Q3) Attempt all of the following :

- a) Explain any five functions supported by IPv4. [4]
- b) Explain Signal Driven and Asynchronous I/O mode. [4]
- c) Explain inet_ntop. [2]

Q4) Attempt all of the following :

- a) Explain Byte ordering function with one program. [4]
- b) Explain shutdown process and SHUT_RD, SHUT_WR, SHUT_RDWR in detail. [4]
- c) Define connect function with UDP. [2]

P.T.O.

Q5) Attempt all of the following :

- a) Explain the syntax of select () [4]
- b) Write a client side code for TCP ECHO client. [4]
- c) Differentiate TCP & UDP. [2]

Q6) Attempt all of the following :

- a) Discuss getservbyname and getservbyport function in detail. [4]
- b) Explain getsockopt and setsockopt in detail. [4]
- c) Write the steps performed by echo server. [2]

Q7) Attempt all of the following :

- a) Explain the concept of fork() and exec(). [5]
- b) Explain the structure of hostent. [5]

Q8) Attempt all of the following :

- a) Explain str_cli function in detail [Revisited] [5]
- b) Explain client server Architecture in detail. [5]



Total No. of Questions : 8]

SEAT No. :

P2281

[Total No. of Pages : 3

[5333] - 2001

M.Sc.

COMPUTER SCIENCE

CS-201: Digital Image Processing

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) a) Explain how image processing is useful by considering any two examples. **[4]**

b) Write short note on “Chain codes”. **[4]**

c) Mention any two energy sources other than EM waves used to obtain image. **[2]**

Q2) a) Write a short note on ‘Hit-or-Miss’ transform. **[4]**

b) Define ‘City-block’ and ‘chess board’ distance between any two point of a digital image. **[4]**

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

Q3) a) Give any two noise models along with their probability density functions and the systems in which they are found. **[4]**

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

c) Calculate the memory required to store a black and white image with 256 gray levels and 1024×1024 resolution. **[2]**

P.T.O.

Q4) a) Explain how bit plane slicing is used to analyze relative importance of each bit used to store a pixel in a digital image. [4]

b) Write short note on ‘signature’. [4]

c) Mention two ways of estimating degradation function. [2]

Q5) a) What are the fundamental steps in edge detection. [4]

b) Write the equation for forward and inverse 2D-DFT. Give significance of each variable. [4]

c) Define reflection and translation operations on a set ‘B’. [2]

Q6) a) Give the orientation of the lines which will be detected using following four masks. [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

b) What is the difference between point processing and neighbourhood processing”. Give one example each. [4]

c) Write the equation for hole filling. [2]

Q7) a) Describe the fundamental steps in digital image processing with the help of a block diagram. [5]

b) Use the following table to find the transformation function that is obtained with histogram equalization techniques. The image is a 3-bit 64×64 digital image. [5]

r_1	n_k
$r_0 = 0$	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

- Q8) a) Explain the steps in processing image in frequency domain. [5]
- b) Define 'Opening' and 'Closing' operations. In what way do they differ from each other. [5]

EEE

Total No. of Questions :8]

SEAT No. :

P2282

[5333]-2002

[Total No. of Pages : 3

M.Sc.

COMPUTER SCIENCE

**CS-202 : Advanced Operating System
(2013 Pattern) (Semester-II)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

- Q1)** a) Write a short note on context of process. [4]
b) Discuss the architecture of UNIX. [4]
c) Explain the syntax of open () system call. [2]

- Q2)** a) Explain different types of memory regions found in every process. [4]
b) Explain the behaviour of following program [4]

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

- c) Explain any two thread functions. [2]

P.T.O.

- Q3)** a) Write a program to demonstrate use of atexit () function. [4]
 b) Describe the following signals. [4]
 i) SIGTERM
 ii) SIGABRT
 iii) SIGSEGV
 iv) SIGKILL
 c) Write any two scheduler related system calls. [2]
- Q4)** a) In what situations window O.S. increases current priority value of threads? [4]
 b) Write a 'C' program which opens a file and goes to sleep for 15 seconds before terminating. [4]
 c) What are Daemons. [2]
- Q5)** a) Write a 'C' program to illustrate lseek () system call. [4]
 b) Depict the scenario of swapping out process. [4]
 c) Justify-No process can preempt another process executing in the kernel. [2]
- Q6)** a) Explain the behaviour of following 'C' program. [4]
 main ()
 {
 int fd;
 char buf [1024];
 fd = create ("junk", 0666).
 lseek (fd, 20001, 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) Explain the following system calls. [4]
i) sigaction ()
ii) sigpending ()
c) What is ACL? [2]

Q7) a) Write the advantages and disadvantages of mmap. [5]

- b) Explain the behaviour of following 'C' program [5]

```
#include <signal. h>
main ()
{
    register int i;
    setgrp ();
    for (i = 0; i < 10; i ++)
    {
        if (fork () == 0)
        {
            if (i & 1)
                setgrp ();
            printf ("pid = %d pgrp = %d \n," getpid (), getpgrp ());
            pause ();
        }
    }
    kill (0, SIGINT);
}
```

Q8) a) Explain the scenario of process creation and process termination. [5]

- b) Write a note on preemptive thread scheduling. [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :4

P2283

[5333] - 2003

M.Sc.

COMPUTER SCIENCE

**CS 203 : Data Mining and Warehousing
(2013 Pattern) (Semester - II)**

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Answer any Five questions.*
- 2) *Figures to the right indicate full marks.*

Q1) Solve

- a) What are the social implication of data mining? [4]
- b) Explain OLAP. [4]
- c) Define : Precision and Recall. [2]

Q2) Solve

- a) Explain overfitting with example. [4]
- b) What are the challenges in web mining? [4]
- c) Why data processing is required? [2]

Q3) Solve

- a) Explain data warehouse architecture with the help of neat diagram. [4]
- b) Construct an FP-Tree on the following data [4]

P.T.O.

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

c) What is chi square Test? [2]

Q4) Solve

a) Generate Frequent item sets using Apriori For the Following transactions with minimum support = 3 [4]

Transaction ID	Items
T 10	M, O, N, K, E, Y
T20	D, O, N, K, E, Y
T30	M, A, K, E
T40	C, A, K, E
T50	C, O, K, E
T60	D, A, Y
T70	B, R, E, A, D

b) Explain linear regression in detail. [4]

c) What is Boot strap? [2]

Q5) Solve

a) Write short note on WEKA. [4]

b) Explain Data integration and data transformation. [4]

c) What is pattern discovery in web data mining. [2]

Q6) Solve

- a) Explain F-measure and confusion matrix. [4]
- b) Explain frequent subgraph mining. [4]
- c) List methods to handle the missing values. [2]

Q7) Solve

- a) Suppose that the data mining task is to cluster the following eight points (with (x, y) representing location into three clusters : A1(2, 10), A2 (2,5), A3(8,4), B1(5, 8), B2(7, 5), B3(6,4), C₁(1, 2), C₂(4, 9). The distance Function is Euclidean distance. Suppose, Initially we assign A1, B1, and C1 as center of each cluster. Apply K-means Algorithm. [5]
- b) Write note on Text mining. [5]

Q8) Solve

- a) Consider the data from employee database. [5]

Department	Status	Age	Salary	Count
Sales	Senior	31..35	46k..50k	30
Sales	Junior	26..30	26k..30k	40
Sales	Junior	31..35	31k..35k	40
Systems	Junior	21..25	46k..50k	20
Systems	Senior	31..35	66k..70k	5
Systems	Junior	26..30	46k..50k	3
Systems	Senior	41..45	66k..70k	3
Marketing	Senior	36..40	46k..50k	10
Marketing	Junior	31..35	41k..45k	4
Secretary	Senior	46..50	36k..40k	4
Secretary	Junior	26..30	26k..30k	6

Give the data tuple having the values “systems, 26..30, 46k..50k”. For the attributes department, age and salary. Find out class label of given tuple using naive Bayesian classification for status.

b) Write note on SVM classifier [5]



Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :3

P2284

[5333] - 2004

M.Sc.

COMPUTER SCIENCE

CS - 205 : Programming with Dot Net

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Answer any Five questions.*
- 2) *All questions carry equal marks.*
- 3) *Figures to the right indicate full marks.*
- 4) *Assume suitable data if necessary.*
- 5) *Neat diagram must be drawn if necessary.*

Q1) Attempt the following:

- a) How connected data architecture is implemented in ADO.NET. Explain with sample c# code. **[4]**
- b) Write a short note on SOAP. **[4]**
- c) What are partial classes. **[2]**

Q2) Attempt the following:

- a) What is Dialog box. Explain Save File Dialog box with example. **[4]**
- b) What is assembly? Explain types of assembly. **[4]**
- c) Explain : TcpListener. **[2]**

Q3) Attempt the following:

- a) Write short note on garbage collection. **[4]**
- b) Write a C# program, accept a directory name and display a list of files in a given directory. **[4]**
- c) What is session. **[2]**

P.T.O.

Q4) Attempt the following:

- a) Explain Brushes in GDIT. [4]
- b) Short note on user-defined exception. Give example. [4]
- c) What are indexers. [2]

Q5) Attempt the following:

- a) What are the access specifiers in C#. [4]
- b) Explain ASP.NET page Life cycle with the help of diagram. [4]
- c) Explain Boxing and unboxing with example. [2]

Q6) Attempt the following:

- a) What is web page and web forms. [4]
- b) Write a console based application in c#, create two linked list and perform following operations.
 - i) Union
 - ii) Intersection.(Use linkedlist $l_1 = \{11, 12, 14\}$ and $l_2 = \{13, 12, 11\}$) [4]
- c) List the properties of checkBox and explain any one with example. [2]

Q7) Attempt the following:

- a) What do you mean by events and delegates in C#, explain with examples. [5]
- b) Explain postback event handling in ASP.NET. [5]

Q8) Attempt all of the following:

- a) Explain Data Reader with example. **[5]**
- b) What is deployment? Explain Xcopy Deployment. And Write a steps to deploy an ASP. NET Website using Xcopy. **[5]**



Total No. of Questions : 8]

SEAT No. :

P2285

[5333]-2005

[Total No. of Pages : 2

M.Sc. (Computer Science)
206 : ARTIFICIAL INTELLIGENCE
(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

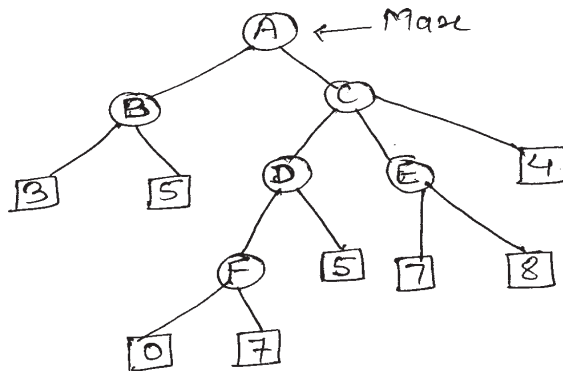
- 1) *Answer any five questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*

- Q1)** a) Write note on Frame & script with suitable examples for each. [4]
b) Explain Generate and Test algorithms by giving its advantages and disadvantages. [4]
c) What is AI? [2]
- Q2)** a) Describe the A* algorithm. [4]
b) Define constraint satisfaction problem? Solve SEND+MORE=MONEY using constraint satisfaction problem. [4]
c) Write note on decision Tree. [2]
- Q3)** a) Represent each of the following sentences in FOL (First - order logic) [4]
i) If it's raining, then the ground is wet.
ii) Mohan knows Radh's father.
iii) If the switch is on and the light is off then the light-bulb is broken.
iv) All computers have a processor.
b) Describe the STRIPS language for representing states, goals and operators with in a planning system. [4]
c) What is Best - First search techniques? [2]
- Q4)** a) Explain MINI-MAX search techniques for solving any game. [4]
b) What is Heuristic search and Write heuristics function for Tic-tac toe game. [4]
c) State any two approaches to knowledge Representation. [2]

P.T.O.

- Q5)** a) Write a short note on simulated annealing search strategy. [4]
 b) Write note on [4]
 i) Rote learning.
 ii) Explanation - based learning.
 c) Explain Hill climbing algorithm. [2]

- Q6)** a) Consider the following game tree



Apply alpha-beta pruning algorithm on the tree and show alpha-beta values. [4]

- b) Translate the following FOL (first-order logic) statements into English statements. [4]
 i) $\forall x: \text{student}(x) \Rightarrow \text{Smart}(x)$
 ii) $\exists x: \text{student}(x) \wedge \text{Smart}(x)$
 iii) $\text{Takes}(\text{Ram}, \text{computer}) \vee \text{Takes}(\text{Ram}, \text{Mobile})$
 iv) $\forall x (\text{student}(x) \Rightarrow \exists y (\text{course}(y) \wedge \text{Takes}(x, y)))$
 c) Define Forward and Backward chaining. [2]

- Q7)** a) Compare propositional logic and predicate logic. [5]
 b) What is difference between expert system and traditional system? Give the advantages and disadvantages of expert system. [5]

- Q8)** a) Explain the algorithm to convert WFFs to CNF. [5]
 b) Parse each of the sentences using top-down and bottom-up approach. [5]
 i) Merry watered the plants.
 ii) The beown dog ate the bone.



Total No. of Questions : 8]

SEAT No. :

P2286

[5333]-2006

[Total No. of Pages : 2

M.Sc. (Computer Science)

**CS - 207 : ADVANCE DESIGN AND ANALYSIS OF
ALGORITHMS**

(2013 Pattern) (Semester - II)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

Q1) Attempt all of the following:

- a) What are Fibonacci heaps? Write applications of Fibonacci heaps. [4]
- b) Explain suffix trees? List out its applications. [4]
- c) What is flow network. [2]

Q2) Attempt all of the following:

- a) Write Boyer-Moore string search algorithm. [4]
- b) Write a note on steiner forest. [4]
- c) What is optimization problem. [2]

Q3) Attempt all of the following:

- a) Explain Topological Sorting with example. [4]
- b) What is heuristic optimization. [4]
- c) What are dynamic trees? Explain their significance. [2]

Q4) Attempt all of the following:

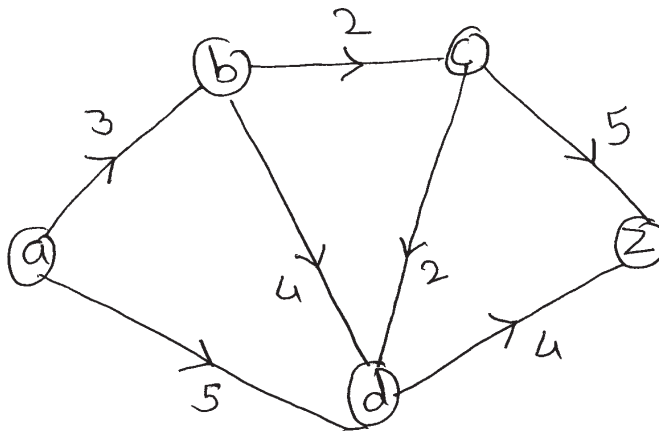
- a) Where do we use interior-point methods? Explain in detail. [4]
- b) Write a note on vertex cover problem. [4]
- c) Write any two applications of splay trees. [2]

P.T.O.

Q5) Attempt all of the following:

- a) Find out maximum flow through the network.

[4]



- b) Explain primal dual method to solve TSP.

[4]

- c) What is Patricia trees?

[2]

Q6) Attempt all of the following:

- a) What is principle behind Rabin-Karp algorithm. Explain its working. [4]

- b) Write a note on convex optimization. [4]

[4]

- c) Explain K-median problem in short. [2]

[2]

Q7) Attempt all of the following:

- a) Explain the use of B-trees in memory management. [5]

[5]

- b) What is the principle of Knuth-Morris-Pratt algorithm? Explain Compute-Prefix function. [5]

[5]

Q8) Attempt all of the following:

- a) Discuss any problem to which complete enumeration is applied. [5]

[5]

- b) Write a note on Simplex Method. [5]

[5]



Total No. of Questions : 8]

SEAT No. :

P2287

[Total No. of Pages : 3

[5333] - 3001

M.Sc.

COMPUTER SCIENCE

CS-301: Software Metrics and Project Management

(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any five questions from given eight questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicates full marks.*
- 4) *Use of simple calculators is allowed.*

Q1) Attempt the following:

- a) Explain in brief tools and methods used to improve productivity. [4]
- b) Explain the outputs of the administrative closure in project communication management. [4]
- c) What do you mean by project plan? [2]

Q2) Attempt the following:

- a) Describe project selection methods. [4]
- b) Write short note on Gantt chart. [4]
- c) Define [2]
 - i) cost variance
 - ii) schedule variance

P.T.O.

Q3) Attempt the following:

- a) What are the characteristics of mature process. [4]
- b) Write a note on McCall's software quality model. [4]
- c) Define [2]
 - i) productivity
 - ii) software reliability

Q4) Attempt the following:

- a) Explain project staff acquisition in detail. [4]
- b) Write a short note on Risk Quantification in risk management. [4]
- c) List all development phases of project life cycle. [2]

Q5) Attempt the following:

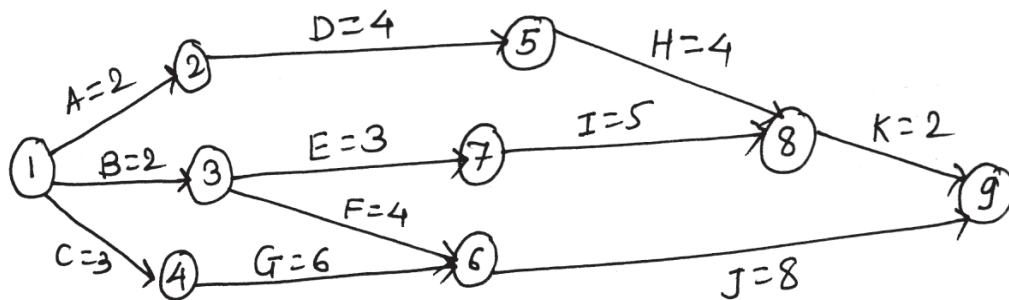
- a) What is solicitation planning? And explain solicitation in brief. [4]
- b) Explain the role of data collection in software measurement with the help of suitable diagram. [4]
- c) Define project charter. [2]

Q6) Attempt the following:

- a) Which factors affect the quality of IT project. [4]
- b) Explain roles and responsibilities of measurement team. [4]
- c) Define [2]
 - i) CPIF
 - ii) CPPC

Q7) Attempt the following:

- a) Describe project execution tools & techniques. [5]
- b) Define critical path analysis and solve the following. [5]



Q8) Attempt the following:

- a) What is project? Explain the attributes of project. [5]
- b) Explain the process involved in human resource management. [5]

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Total No. of Questions : 8]

SEAT No :

P 2288

[5333]-3002

[Total No. of Pages :2

M.Sc.

COMPUTER SCIENCE

**CS - 302 : Mobile Computing
(2013 Pattern) (Semester-III)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any Five of the following.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*

Q1) Attempt all of the following:

- a) Explain registration process in Mobile IP. **[4]**
- b) What are the requirements from Mobile IP. **[4]**
- c) Define Cell breathing. **[2]**

Q2) Attempt all of the following:

- a) Explain HAWAII with its advantages & disadvantages. **[4]**
- b) Compare FACOA with CO-COA. **[4]**
- c) What is WAE? **[2]**

Q3) Attempt all of the following:

- a) Explain in brief wireless session protocol. **[4]**
- b) Why optimization in Mobile IP needed? What are the limitations of optimization? **[4]**
- c) Explain Agent Solicitation. **[2]**

P.T.O.

Q4) Attempt all of the following:

- a) What are the advantages & disadvantages of CDMA? [4]
- b) Explain Reference model in GSM. [4]
- c) How MACA resolves hidden & exposed terminal problem? [2]

Q5) Attempt all of the following:

- a) Explain WAP gateway in details. [4]
- b) Explain UMTS architecture. [4]
- c) What is MN and CN. [2]

Q6) Attempt the following:

- a) “CDMA-CA” used in wireless LAN instead of “CDMA-CD”. Comment & Justify. [4]
- b) Explain functions of RNC. [4]
- c) What is OVSF. [2]

Q7) Attempt all of the following:

- a) How event Handling is done in Android O.S. [5]
- b) What is triangular routing behaviour? How it is avoided in Mobile IP? [5]

Q8) Attempt all of the following:

- a) Explain GPRS architecture. [5]
- b) What are problems associated with reverse path in mobile IP? [5]



Total No. of Questions : 8]

SEAT No :

P 2289

[Total No. of Pages :2

[5333]-3003

M.Sc.

COMPUTER SCIENCE

**CS - 303 : Soft Computing
(2013 Pattern) (Semester-III)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any five questions from given eight questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right indicate full marks.*
- 4) *Use of simple calculator is allowed.*

Q1) a) What is neural network. Explain any two applications. **[4]**

b) For the given 2 fuzzy sets find union and intersection **[4]**

$$\tilde{A} = \left\{ \frac{0.15}{1} + \frac{0.25}{2} + \frac{0.6}{3} + \frac{0.9}{4} \right\} \quad \tilde{B} = \left[\frac{0.2}{1} + \frac{0.3}{2} + \frac{0.5}{3} + \frac{0.8}{4} \right]$$

c) Define support of a membership function. **[2]**

Q2) a) Explain properties of TLNS. **[4]**

b) For the following Fuzzy Relation Matrix R, determine λ - cut relations for λ - values on R, $\lambda_1, \lambda_{0.8}, \lambda_{0.6}, \lambda_{0.3}$ **[4]**

$$R = \begin{bmatrix} 1 & 0.8 & 0.3 & 0.7 \\ 0.8 & 1 & 0.9 & 1 \\ 0.3 & 0.9 & 1 & 0.6 \\ 0.7 & 0.1 & 0.6 & 1 \end{bmatrix}$$

c) Write advantages of GA. **[2]**

P.T.O.

- Q3)** a) What is GA ? Explain crossover and mutation operation with example. [4]
 b) Explain concept of Fuzzy set and Fuzzy numbers with example. [4]
 c) Explain Error correction rule? [2]

- Q4)** a) Determine 'If P then R' for given Fuzzy sets [4]

$$\tilde{P} = \left\{ \frac{0.1}{a} + \frac{0.9}{b} + \frac{0.0}{c} \right\} \quad \tilde{R} = \left\{ \frac{0}{d} + \frac{1}{e} + \frac{0}{h} \right\}$$

- b) Explain multilayered network architectures. [4]
 c) What is Intensification. [2]

- Q5)** a) Consider Fuzzy sets [4]

$$\tilde{A} = \left\{ \frac{1}{a} + \frac{0.5}{b} + \frac{0.2}{c} \right\}, \quad \tilde{B} = \left\{ \frac{0}{d} + \frac{0.5}{e} + \frac{0.3}{f} \right\}, \quad \tilde{C} = \left\{ \frac{0.1}{g} + \frac{0.6}{h} + \frac{1}{i} \right\}$$

Find the following :

- i) $R = A \times B$ ii) $S = B \times C$ iii) $T = \text{RoS}$ using max-min composition.

- b) Define GA, Application of GA. [4]
 c) What is centroid Method. [2]

- Q6)** a) The perceptron Learning algorithm works well for linearly separable sets but does not guarantee for linearly non-separable sets. Explain. [4]
 b) Write short note on Zadeh's extension principle. [4]
 c) Write Sigmoidal function. [2]

- Q7)** a) List components of ANN and explain. [5]
 b) Explain Methods of Defuzzification. [5]

- Q8)** a) Write strengths and Limitations of GA. [5]
 b) Write features of membership functions of Fuzzy sets with examples. [5]

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Total No. of Questions : 8]

SEAT No. :

P2290

[5333]-3004

[Total No. of Pages : 2

**M.Sc. - (Computer Science)
CS - 305 : WEB SERVICES
(2013 Pattern) (Semester - III)**

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

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

- Q1)** a) Write down WSDL document for obtaining the area of circle if radius is inputted. [4]
b) What is cloud computing. Briefly summarize the commonly accepted essential characteristics of cloud computing. [4]
c) “SOAP fault is caused due to client or server failure”. State T/F with Justification. [2]
- Q2)** a) What is SOAP? Give the structure of SOAP message, explain it. [4]
b) State the types of virtualization for cloud computing, explain any three. [4]
c) List any four WSDL tools. [2]
- Q3)** a) Explain any four publisher API message functions. [4]
b) Write a SOAP RPC request and response code for requesting multiplication of two integers. [4]
c) Give any two online websites making use of web services. [2]
- Q4)** a) Elaborate the use of UDDI based on software developers perspective and business analyst’s perspective. [4]
b) Show the roles and operations in SOA with the help of neat labeled diagram, also explain it [4]
c) Give the use of SOAP actor attribute? [2]

P.T.O.

- Q5)** a) Write a note on paas level application security. [4]
b) Write in detail on SOAP with attachments. [4]
c) What is XML and ebXML? [2]
- Q6)** a) Write the web service logic for conversion of temperature from Fahrenheit to celsius and Celsius to Fahrenheit using JAVA coding syntax. [4]
b) Elaborate the interperability issue in Web Services. [4]
c) List the impacts and short comings of web services. [2]
- Q7)** a) Describe UDDI data structures and their relationships with figure. [5]
b) Write in detail On Xen, Vmware hypervisors with their features. [5]
- Q8)** a) Describe the anatomy of WSDL document in detail. [5]
b) Explain how web service is consumed by a consumer with appropriate figure. [5]



Total No. of Questions :8]

SEAT No. :

P2291

[5333]-3005

[Total No. of Pages : 2

M.S.c.-II (Computer Science)

CS-306 : DATABASE AND SYSTEM ADMINISTRATOR

(2013 Pattern) (Semester-III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any five questions from given eight questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Assume suitable data if necessary.*

- Q1)** a) Explain the mysql architecture with neat diagram. [4]
b) What are the protocols used for networking? [4]
c) What is the use of statement terminators in mysql. [2]
- Q2)** a) Explain the working of InnoDB storage engine. [4]
b) How file and directory listing is done in linux? [4]
c) Give any 2 responsibilities of system administrator. [2]
- Q3)** a) How to use script files with mysql? [4]
b) What are the different types of file and directory permissions in linux. [4]
c) What is key buffer and buffer pool? [2]
- Q4)** a) Explain how mysql uses disk space. [4]
b) Explain mysql output formats. [4]
c) Give any 2 utility programs that can be used with MyISAM storage engine. [2]
- Q5)** a) What are the different servers used for networking? [4]
b) Explain how mysql uses memory. [4]
c) Give any 2 features of memory storage engine. [2]

P.T.O.

- Q6)** a) What are different file manipulation commands under linux? [4]
b) What are the daily tasks of system administrator. [4]
c) Write down commands for dump and reload data using mysqldump. [2]
- Q7)** a) Explain the working of merge storage engine. [5]
b) Explain any 5 client commands used in mysql client program. [5]
- Q8)** a) Explain the working of cluster storage engine. [5]
b) Explain explicit table locking. [5]



Total No. of Questions : 8]

SEAT No :

P 2292

[5333]-3006

[Total No. of Pages :2

M.Sc. - II

COMPUTER SCIENCE

CS - 307 : Functional Programming

(2013 Pattern) (Semester-III) (Elective)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *All questions carry equal marks.*
- 4) *You are advised to attempt not more than 5 questions.*
- 5) *Assume suitable data, if necessary.*

Q1) Attempt ALL:

[4+4+2]

- a) Give relevance of functional programming.
- b) Explain β (beta) reduction.
- c) What is function ducktyping?

Q2) Attempt ALL:

[4+4+2]

- a) Describe various types of functional languages.
- b) What is Lambda equality?
- c) How to test type of a file in Python?

Q3) Attempt ALL:

[4+4+2]

- a) Explain 2 types of reduction rules.
- b) How command line arguments work in Python.
- c) What is first and higher order functions?

P.T.O.

Q4) Attempt ALL: **[4+4+2]**

- a) Discuss overloading in Python.
- b) How dictionary elements are updated and deleted in Python?
- c) What is Eta conversion?

Q5) Attempt ALL: **[4+4+2]**

- a) What do you mean by anonymous functions?
- b) Explain double underscore prefix in Python.
- c) What is the use of triple quotes in Python strings.

Q6) Attempt ALL: **[4+4+2]**

- a) How directory tree is traversed in Python?
- b) What is the difference between raw string and Unicode string in Python?
- c) Explain subclass implementation in Python.

Q7) Attempt ALL: **[5+5]**

- a) Explain function 'Apply to All' in detail.
- b) How can a non-tail recursive function be converted to tail recursive one?

Q8) Attempt ALL: **[5+5]**

- a) What are the benefits of lambda notation?
- b) Explain 2 types of reduction rules.

→ → →

Total No. of Questions : 8]

SEAT No. :

P2293

[5333] - 3007

[Total No. of Pages : 2

M.Sc. - II (Computer Science)
CS - 308 : BUSINESS INTELLIGENCE
(2013 Pattern) (Semester - III)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Answer five questions.*
- 2) *Figures to the right indicate full marks.*

- Q1)** a) Describe the need for BI integration. [4]
b) Explain how collaborative decision making works with respect to BI implementation. [4]
c) Define : BPM [2]
- Q2)** a) Explain the challenges associated with the implementations of Natural Language Processing (NLP). [4]
b) Explain any two steps in CRISP-DM process. [4]
c) "It is difficult to perform cost-benefit analysis of BI" comment. [2]
- Q3)** a) What are the different types of KPI'S. Explain any one in brief. [4]
b) Explain the applications of BPM. [4]
c) Give any 2 major difference between a traditional data warehouse and a real-time data warehouse. [2]
- Q4)** a) Describe the algorithm used in decision tree and how it helps in BI analytical approach. [4]
b) What is clickstream analysis? How is it useful in web mining? [4]
c) Define : Meta data [2]

P.T.O.

- Q5)** a) What are the different types of data warehouse? State the differences between them. [4]
- b) Define web structure mining. Give the difference between structure mining and web content mining. [4]
- c) List the benefits of Real-time data warehouse. [2]
- Q6)** a) What is the major difference between cluster analysis and classification? [4]
- b) Explain six sigma in performance management methodology. [4]
- c) What is Topcat? What does TopCat do? [2]
- Q7)** a) A company has installed automatic machines at different location in the country. The machines are required to be loaded physically with different items. The customer is provided with a menu using which he/she can select an item to be purchased. Can tender the necessary cost and the selected item will be given to the customer by automated machine. The company wants to control all these automated machines with minimum errors in operations and minimum down-time. Also, the possibility of unavailability of items in the machine should be reduced. Suggest a BI based solution for this problem. [5]
- b) How a Balanced Score Card (BSC) align strategies and actions. [5]
- Q8)** a) What are the major factors that effect the decision making process in BI implementations? [5]
- b) XYZ food company is the worlds largest producer and marketer of high-quality fresh fruit and produce. The fresh fruit devision was experiencing major performance issues in several of its mission-critical applications, which greatly hindered the ability to deliver on the company's promise to deliver fresh products. The mission-critical applications that supports the company's logistic functions include transportation, product tracking and trace ability from the xyz farms to distribution centres in the U.S. The goal is to deliver fresh products. Explain the business strategy solution that you will offer to the above case study. [5]



Total No. of Questions : 8]

SEAT No. :

P2294

[Total No. of Pages : 2

[5333] - 4001

M.Sc.

COMPUTER SCIENCE

CS-402: Parallel Computing

(2013 Pattern) (Semester - IV) (Elective)

Time : 3 Hours]

[Max. Marks : 80

Instructions to the candidates:

- 1) *Neat diagrams must be drawn wherever necessary.*
- 2) *Figures to the right indicate full marks.*
- 3) *All questions carry equal marks.*
- 4) *You are advised to attempt not more than 5 questions.*
- 5) *Assume suitable data, if necessary.*

Q1) Attempt ALL :

[4+4+2]

- a) Explain Bulk Synchronous Parallel (BSP) model in detail.
- b) How multithreading is done using TBB?
- c) Write a short note on master/worker paradigm in PVM.

Q2) Attempt ALL:

[4+4+2]

- a) Give an overview of Programming with Shared Memory.
- b) What is data-intensive computing?
- c) Write scope of parallel computing.

Q3) Attempt ALL:

[4+4+2]

- a) What is the use of workshare construct in OpenMP?
- b) Write any four OpenMP constructs.
- c) How to compute average using MPI_Scatter and MPI_Gather?

P.T.O.

Q4) Attempt ALL: **[4+4+2]**

- a) Explain Foster's design paradigm for Multi computing programming.
- b) How debugging is done in cluster programs?
- c) What do you mean by barrier point?

Q5) Attempt ALL: **[4+4+2]**

- a) What is the role of PVM daemon?
- b) Explain is the use of nowait clause?
- c) What do you mean by continuation in the context of Cilk++ programming?

Q6) Attempt ALL: **[4+4+2]**

- a) Write a PVM program that sums up the values of an integer array.
- b) What do you mean by Critical and Atomic constructs?
- c) Write a short note on CUDA.

Q7) Attempt ALL: **[5+5]**

- a) Explain the use of MPI in Cluster Computing.
- b) Give Task Parallelism Tools in Cilk++.

Q8) Attempt ALL: **[5+5]**

- a) Explain cilk_spawn and cilk_sync with example.
- b) Write a note on Partitioning and Divide and Conquer Strategies.

EEE

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :2

P2295

[5333] - 4002

M.Sc.

COMPUTER SCIENCE

CS - 403 : Embedded System

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Answer any five Questions*
- 2) *Neat diagrams must be drawn wherever necessary*
- 3) *Figures to the right indicate full marks*

- Q1)** a) Write short note on RISC architecture [4]
b) What is meant by PCB and TCB? What are the analogies in PCB and TCB? [4]
c) Give any four examples of embedded System [2]
- Q2)** a) Describe functional of linker, locator interpreter and assembler [4]
b) Explain JTAG and ONCE briefly [4]
c) Name some of the hardware parts of embedded systems? [2]
- Q3)** a) How can a real time performance be derived from a non real time system? [4]
b) Define buffer? Explain buffer exchange in brief [4]
c) What are the goals of RTOS? [2]
- Q4)** a) What is a target system? how does the target system differ from the final embedded system. [4]
b) Write short note on paging technique of memory mapping [4]
c) Define real time clock (RTC) [2]

P.T.O.

- 5) a) Explain content switching? [4]
b) Explain the problem of data logging on hard disc? How it can be resolve? [4]
c) Define system on chip (SOC) with an example [2]
- 6) a) List various forms of memories used in embedded systems. What are the functions of memories? [4]
b) Explain use of multiple semaphores for a task? [4]
c) What is interrupt? List different types of interrupts. [2]
- 7) a) Explain the basic design of Real Time operating system (RTOS) [5]
b) Explain task level and symbolic debugger [5]
- 8) a) Explain the rate monotonic co-operative scheduling [5]
b) Draw a simple parallel I/O port and explain its basic operation [5]



Total No. of Questions : 8]

SEAT No. :

P2296

[Total No. of Pages : 2

[5333] - 4003

M.Sc.

COMPUTER SCIENCE

CS- 404: Software Quality Assurance

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks : 50

Instructions to the candidates:

- 1) *Attempt any five questions.*
- 2) *Neat diagrams and must be drawn wherever necessary.*
- 3) *Figures to the right indicates full marks.*

Q1) Answer the following:

- a) Explain the term software Quality Assurance. Why software Quality is important. [4]
- b) Explain in detail FTR - Formal technical Review and explain various types of reviews. [4]
- c) Explain configuration management. [2]

Q2) Answer the following:

- a) What are the Mc Call's quality factors? Explain. [4]
- b) Write short note on verification and validation. [4]
- c) Explain CASE TOOLS. [2]

Q3) Answer the following:

- a) Write difference betⁿ peer review and walk throughs. [4]
- b) Explain various software Development risks. [4]
- c) Write difference between project and product. [2]

P.T.O.

Q4) Answer the following:

- a) Explain features of CMM. [4]
- b) Write a short note on Run charts. [4]
- c) Explain inspections in software quality. [2]

Q5) Answer the following:

- a) Explain in detail job role of tester and debugger. [4]
- b) What are the sources of corrective and preventive actions? [4]
- c) What is version control? [2]

Q6) Answer the following:

- a) Explain software testing Lifecycle. [4]
- b) Explain process quality metrics in SQ. [4]
- c) Define software errors. [2]

Q7) Answer the following:

- a) Define SQA with it's objectives. [5]
- b) Explain scatter diagram with example. [5]

Q8) Answer the following:

- a) Define QC with it's tools and techniques. [5]
- b) What is use of quality cost for decision making. [5]

EEE

Total No. of Questions :8]

SEAT No. :

[Total No. of Pages :3

P2297

[5333] - 4004

M.Sc.

COMPUTER SCIENCE

CS - 405 : Modeling & Simulation

(2013 Pattern) (Semester - IV)

Time : 3 Hours]

[Max. Marks :50

Instructions to the candidates:

- 1) *Attempt any Five questions.*
- 2) *Neat diagrams must be drawn wherever necessary.*
- 3) *Figures to the right side indicate full marks.*
- 4) *Assume suitable data if necessary.*

Q1) Attempt the following:

- a) Explain the concept of cellular automata with an example. **[4]**
- b) Explain the types of system with examples of each. **[4]**
- c) What is fitness of a cell. **[2]**

Q2) Attempt the following:

- a) Differentiate between discrete and continuous system. **[4]**
- b) Discuss the importance of sensitivity analysis **[3]**
- c) Explain hybrid simulations. **[3]**

Q3) Attempt the following:

- a) What do you understand by Qualitative and Quantitative comparison of Model. **[4]**
- b) What is switching automata. **[2]**
- c) Write a note on Actor based simulation. **[4]**

P.T.O.

Q4) Attempt the following:

- a) Explain graph or network transition based simulations. [4]
- b) What are the advantages of experimenting with a model rather than the actual system. [4]
- c) How is testing of hypothesis done. [2]

Q5) Attempt the following:

- a) Write a note on hybrid systems and their simulators. [4]
- b) Discuss the concept of probability in modeling. [4]
- c) What is stepped and event based time. [2]

Q6) Attempt the following:

- a) Discuss Mesh based simulations. [5]
- b) What is a generator and transducer. [3]
- c) What is a discrete event. [2]

Q7) Write a note on the following.

- a) What are the pitfalls of Simulation. [5]
- b) Write a note on Random Number Generators. [5]

Q8) Attempt the following Case Study and answer the following questions.

Single server queuing system.

Consider a service facility with a single server for which we would like to estimate the (expected) average delay in queue (line) of arriving customers,

where the delay in queue of a customer is the length of the time interval from the instant of his arrival at the facility to the instant he begins being served. For the objective of estimating the average delay of a customer, the state variables for a discrete event simulation model of the facility would be the status of the server, i.e., either idle or busy, the number of customers waiting in the queue to be served (if any) and the time of arrival of each person waiting in the queue. The status of the server is needed to determine, upon a customer's arrival, whether the customer can be served immediately or must join the end of the queue. When the server completes serving a customer, the number of customers in the queue is used to determine whether the server will become idle or begin serving the first customer in the queue. The time of arrival of a customer is needed to compute his delay in queue, which is the time he begins being served (which will be known) minus his time of arrival. There are two types of events for this system: the arrival of a customer and the completion of service for a customer, which results in the customer's departure. An arrival is an event since it causes the (state variable) server status to change from idle to busy or the (state variable) number of customers in the queue to increase by 1.

Questions

- a) Define Discrete and Continuous system. Identify whether the System is Discrete or Continuous System and justify your answer. **[5]**
- b) Draw flowcharts for depicting various phases in Modeling and Simulation of the problem with correct symbols and flow of execution. **[5]**

