Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(CSE)/SEM-7/CS-704H/2010-11

2010-11

NETWORK APPLICATIONS

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

   i) 'Sliding Window' and 'Look Ahead Buffer' is maintained by

      a) LZ78 scheme

      b) Shannon-Fano coding scheme

      c) LZ77

      d) Huffman coding scheme.

   ii) 'Delta Encoding' is a special case of

      a) 'RLE'

      b) statistical dictionary based compression scheme

      c) arithmetic encoding technique

      d) differential compression scheme.

iii) Huffman coding scheme can also be known as

a) minimum redundancy coding

b) probability based statistical modeling scheme

c) both (a) and (b)

d) dynamic dictionary based compression technique.

iv) Which of the following statement is not correct regarding the distributed DBMS ?

a) Replication is the operation of copying same database objects in multiple locations of the databases

b) Mixed fragmentations are always merging or integrating of multiple horizontal fragments

c) Each replicated fragments will be updated individually, in multiple database locations or sites

d) Global schema is also known as the site independent schema for DDBMS reference architecture.

v) Which of the following statement is true regarding the distributed computing systems ?

a) It is basically a collection of dump terminals at different geographical locations

b) Results of the computation, at any particular node, is always broadcasted throughout the network

c) Both (a) and(b)

d) It is basically a collection of processors in different geographical locations, having its own local memory.

vi) HTTP is also known as

a) stateless protocol

b) extensible mark-up language

c) both (a) and (b)

d) web server.

vii) In case of distributed DBMS, the process of 'Check pointing' and 'Cold restarts' are mainly used for

a) horizontally fragmenting the original database

b) vertically fragmenting the original database

c) dealing with recovery / maintainability aspects as well as lost update problems

d) deleting all replicated fragments that exists in every locations or sites.

viii) In case of distributed DBMS the distribution transparency mechanism normally tries to maintain

a) replication as well as fragmentation transparency

b) only record based transparency

c) only attribute based transparency

d) no transparency, for data or file.

ix) Which of the following statement is true regarding the 'Interruption' attack ?

a) This type of attack causes interception and subsequent modification of the data

b) This type of attack causes only loss of the integrity of the data

c) This type of attack causes non-availability of the data or resources which was sent by the authorized user

d) None of these.

x) Which of the following statement is not correct regarding the 'Application Gateway' ?

a) Application Gateway is a typical type of firewall that uses HTTP as well as FTP

b) Application Gateway is a typical type of firewall that is also known as proxy server

c) Application Gateway is a typical type of firewall that uses TCP/IP connections

d) Application Gateway is a typical type of software that generates and transmits viruses, worms and Trojans.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. a) What do you mean by entropy ?

b) What do you mean by 'Dynamic dictionary' based on compression techinque ?

c) What is the full form of 'bpp' ? 2 + 2 + 1

3. a) Explain lossy and lossless compression techniques with suitable examples.

b) Give one example of a 'Single pass' data compression technique. (2 + 2) + 1

4. a) Discuss some of the advantages of using distributed computing systems.

b) Discuss one problems or challenge that may arise due to the use of Distributed Computing Systems. 4 + 1

5. a) What do you mean by strict 2-phase locking protocol ?

   b) What is the physical image of fragments ?

   c) What is the syntax of denoting the physical image of a global relation R with its i th fragment if at site j ?

   2 + 2 + 1

6. a) What do you understand by 'Cipher Text' ?

   b) What is Crypt analysis ?

   c) Give an example of a Web Server. 2 + 2 + 1

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

7. a) Discuss the process of Delta Encoding technique with an example.

   b) Consider the following string as

      A B A B C D A B C E P

      Now perform 'LZ77' encoding for this above mentioned string. Write all the necessary steps and make your own suitable assumptions whenever required.

   c) Consider the following sequence of symbols for a given mesage as

      A A B B C C D D

      i) Now calculate the number of bits required for representing each individual symbols, with the help of its entropy.

      ii) Hence also calculate the average code length in bits/symbol for this whole message.

      5 + 5 + (4 + 1)

8. a) Discuss the process of 'Huffman Encoding' technique with a suitable example.

   b) What do you mean by 'Arithmetic coding' ?

   c) Discuss some of the benefits as well as demerits regarding the 'LZ77' and 'LZ78' encoding techniques.

   d) Consider the following set of symbols with their probability of occurrence, as mentioned in the bracket :

      A (0·4), B (0·3), C (0·2), D (0·1).

      Now calculate the bit encoding for each individual symbols using the 'Shannon-Fano' coding. 5 + 2 + 4 + 4

9. a) Describe the process of message passing between the client machine and the server machine, in case of distributed computing systems.

   b) What is Lamports total ordering rule for the distributed computing systems ?

   c) Discuss some of the advantages of distributed DBMS over centralized DBMS. What is the problem with replication in case of the distributed DBMS ?

      5 + 3 + (5 + 2)

10. a) Discuss the concept of deadlock formation in case of the distributed DBMS ?

    b) What are the different locking approaches that are used for the distributed DBMS concurrency control scenario, in order to maintain the consistency of the database ?

    c) What do mean by Top-Down and Bottom-Up approaches for the distributed DBMS design ? Write down at least one correctness rule for constructing the fragmentation in case of distributed DBMS.

5 + 5 + (2 + 2 + 1)

11. a) Discuss the following terms :

    i) Trojan Horse

    ii) Applets and ActiveX controls

    iii) Cookies.

    b) State the different types of firewalls and their activities.

(3 + 3 + 3) + 6

12. Write short notes on any *three* of the following : 3 × 5

    a) Arithmetic encoding

    b) LZ78

    c) Replay attack

    d) RSA technique

    e) Check-pointing.