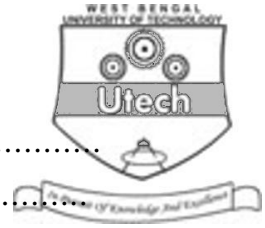

Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.TECH (CSE)/SEM-7/CS-704H/2012-13

2012

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 : $10 \times 1 = 10$

   i) Statistical Dictionary is used for the decompression of

      a) LZ77 b) LZ78

      c) both (a) and (b) d) Huffman Coding.

   ii) Arithmetic Coding technique for the input of a string of characters should generate

      a) a string of same characters

      b) an integer value greater than the length of the input string

      c) a floating point number

      d) zero / blank encoding.

iii) Dynamic dictionary is not transmitted for

a) LZ78

b) Huffman Encoding

c) Shannon-Fano Encoding

d) none of these.

iv) Entropy of a character doesn't depend on the

a) number of occurrences of that character

b) position of that character in the data file

c) both (a) and (b)

d) none of these.

v) Shannon-Fano coding is an example of

a) differential encoding

b) variable length coding

c) dictionary based coding

d) none of these.

vi) Lamport's mutual exclusion algorithm is related to

a) data encryption

b) data compression

c) total ordering for distributed systems

d) distributed global query processing.

vii) In distributed computing system different nodes in the network can communicate through

a) RAM to RAM data exchange

b) Broadcasting through the network

c) Kernel to Kernel message passing

d) none of these.

viii) The term 2PC is related to

a) distributed DBMS transaction processing

b) distributed DBMS global schema

c) distributed DBMS fragment design

d) distributed DBMS fragmentation transparency.

ix) In case of distributed DBMS, the 'union' operation, which is mainly applied on the individual Data Base fragments, are used for the purpose of

a) Deleting the records in those individual Data Base fragments

b) Modification of the records in those individual Data Base fragments

c) Merging those individual Data Base fragments, which are required for the distributed global query processing

d) None of these.

x) DOS attack results into

a) loss of confidentiality, as well as subsequent modification of the data

b) generation of viruses

c) integrity violations in the transferred data between the authenticated users

d) non-avaialability of the data or resources for the authenticated users.

GROUP – B

(Short Answer Type Questions)

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

2. What are the main advantages of data compression ? What do you mean by Entropy ? 3 + 2

3. Discuss some of the advantages of Distributed Computing Systems ? What do you mean by minimum redundancy encoding ? 3 + 2

4. Discuss some of the advantages of fragmentation for the Distributed DBMS. Is there any disadvantage of replication for Distributed DBMS ? Explain. 3 + 2

5. Discuss some of the correctness rules related to the Distributed DBMS design criteria.

GROUP – C

(Long Answer Type Questions)

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

6. a) Compare some of the salient features of LZ77 and LZ78 technique. 4

   b) What do you mean uniquely decodable symbols ? 2

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

   A (0·5), *B* (0·3), *C* (0·1), *D* (0·05), *E* (0·05)

i) Now generate the Huffman tree based on the probability of these given set of symbols.

ii) Hence also calculate the Huffman code for each individual symbols for the given set of symbols.

iii) Also compute the average code length for the given set of symbols based on this Huffman code.

5 + 2 + 2

7. a) Discuss the differences between

i) Entropy and Encryption

ii) 2PL and Strict 2PL

iii) HTTP and HTML.

Consider the following sub string of symbols :

ABACDACECAM. 3 × 2

b) Perform the LZ78 encoding process stepwise for this above mentioned sub string and write the corresponding dictionary tokens for the whole sub string.

c) Perform the LZ78 decoding process stepwise, considering the LZ78 encoding tokens for this above mentioned sub string.

d) Also calculate the compression ratio considering the LZ78 encoding tokens. 4 + 3 + 2

8. a) State the Lamport's total ordering rule for the distributed systems.

   b) How the transmitted message formats are represented in case of Distributed Computing Systems ?

   c) Discuss the message transmission procedure involving the client stub and the server stub for the distributed systems, using a suitable diagram.

   d) Describe the different levels of distribution transparency that exists in case of Distributed DBMS.

3 + 3 + 4 + 5

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

   a) Arithmetic Encoding

   b) Distributed Deadlock

   c) Data Fragmentation

   d) Firewalls

   e) Top down & Bottom up design approach for Distributed DBMS.