

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 : $10 \times 1 = 10$
 - 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.



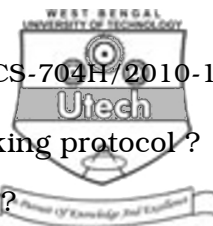
- x) Which of the following statement is ~~not~~ correct regarding the 'Application Gateway' ?
- a) Application Gateway is a typical type of firewall that uses HTTP as well as FTP
 - b) Application Gateway is a typical type of firewall that is also known as proxy server
 - c) Application Gateway is a 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. $3 \times 5 = 15$

2. a) What do you mean by entropy ? $2 + 2 + 1$
- b) What do you mean by 'Dynamic dictionary' based on compression technique ?
- c) What is the full form of 'bpp' ? $2 + 2 + 1$
3. a) Explain lossy and lossless compression techniques with suitable examples. $(2 + 2) + 1$
- 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. $4 + 1$
- 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. $3 \times 15 = 45$

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

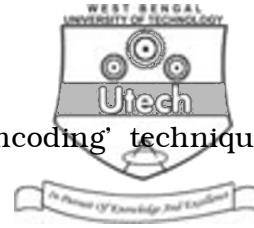
Now perform 'LZ77' encoding for this above mentioned string. Write all the necessary steps and make your own suitable assumptions whenever required.

- c) Consider the following sequence of symbols for a given message 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.

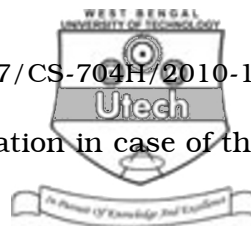
- b) What do you mean by 'Arithmetic coding' ?
- c) Discuss some of the benefits as well as demerits regarding the 'LZ77' and 'LZ78' encoding techniques.
- d) Consider the following set of symbols with their probability of occurrence, as mentioned in the bracket :

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.
