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Invigilator's Signature : Sudipta Saha 14/12/2009

CS/BCA/SEM-5/BCA-501/2009-10

2009

DATA COMMUNICATION & COMPUTER NETWORK

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) Error detection at the data link level is achieved by
   a) Bit suffering
   b) Cyclic redundancy codes
   c) Hamming codes
   d) Equalization.

ii) IP address in the class *B* is given by
   a) 125.123.123.2 b) 191.023.21.54
   c) 192.128.32.56 d) 10.14.12.34.

iii) Given the IP address 18.250.31.14 and subnet mask 255.240.0.0. The calculated subnet address should be
   a) 18.0.0.14 b) 18.31.0.14
   c) 18.240.0.0 d) 18.9.0.14.

iv) TCP is a/an
   a) reliable connection oriented protocol
   b) unreliable connection oriented protocol
   c) reliable connection less protocol
   d) unreliable connection less protocol.

v) ..... is the access protocol used by traditional Ethernet LAN.
   a) CSMA
   b) CSMA/CD
   c) ALOHA
   d) Token Passing.

vi) After a message is decrypted, it is called
   a) Plaintext
   b) Ciphertext
   c) Cryptotext
   d) Cryptonite.

vii) In distance vector routing a router sends out information
   a) at regularly scheduled intervals
   b) only when there is a change in its table
   c) only when a new host is added
   d) only when a new network is added.

viii) The term Polling is related to
   a) multiple-access protocol
   b) data-link control
   c) random access
   d) none of these.

ix) IGMP used in
   a) application layer
   b) presentation layer
   c) session layer
   d) none of these.

x) Shanon capacity determines
   a) noise present in a channel
   b) highest data rate in a noisy channel
   c) channel is noiseless
   d) all of these.

GROUP – B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. a) Distinguish between open-loop congestion control and closed-loop congestion control.

b) What is QOS ? 3 + 2

3. a) What are baud rate and bit rate ? Establish the relationship between these two.

b) Write the advantages of FM technique over AM technique. 3 + 2

4. How does ARQ correct an error ? What is the purpose of the timer at the sender site in system using ARQ ? 2 + 3

5. What is the purpose of flow control ? What would an application use UDP instead of TCP ? 3 + 2

6. Why class of IP address is needed ? Briefly describe the TCP connection establishment and termination. 2 + 3

GROUP – C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

7. a) What is the difference between

i) Circuit switching and Packet switching

ii) TDM and FDM ? 8

b) What advantages does TCP have over UDP ? What are the features for which may TCP be a reliable protocol ? 2 + 2

c) Explain the functions of repeater, bridge and gateways. 3

8. What is the major disadvantages of NRZ encoding technique ? How RZ encoding attempt to solve the problem ? What are the advantages and disadvantages of Parallel Transmission ? How does FDM combine multiple signals into one ? How is time-division switching superior to space-division switching ? 2 + 3 + 4 + 3 + 3

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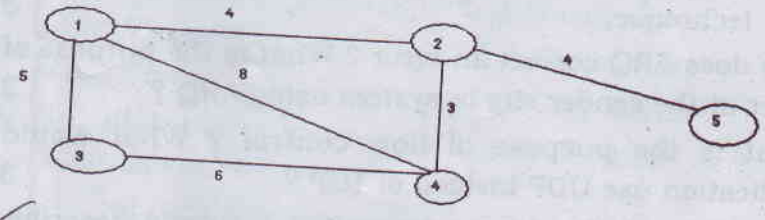
9. What is masking ? A network on the internet has a subnet mask 255.255.240.0. What is the maximum number of hosts it can handle ? ARP an RARP both map addresses from one space to another. In this respect they are similar. However, their implementations are fundamentally different. In what major way do they differ ? Apply Bellman-Ford routing algorithm to reach from node 1 to 5 for the following graph : 3 + 3 + 3 + 6



10. How does single bit error differ from a burst error ? Discuss the concept of redundancy in error detection and correction ? What kind of error is undetectable by the checksum ? Define framing and the reason for its need. What is the purpose of NIC ? What is the difference between connections less and connection oriented service ? What type of service provided by IPV4 ? Explain the difference between tunneling and dual stack strategies during the transition period ? 2 + 2 + 1 + 2 + 1 + 2 + 2 + 3

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

a) UDP

b) X.25

c) HDLC

d) DNS

e) Firewall.

f) Public key cryptography.