No. of Printed Pages : 3

MCS-042

MCA (Revised)

Term-End Examination

December, 2011

03911

MCS-042 : DATA COMMUNICATION AND COMPUTER NETWORKS

Time : 3 hours *Maximum Marks : 100*

Note : *Question number **one** is **compulsory**. Attempt **any three** questions from the rest.*

1. (a) What are the propagation time and transmission time for a 10-M byte image if the bandwidth of the network is 10 Mbps ? Assume that the distance between the sender and the receiver is 12,000 km and the propagation speed is 2.4×10^8 m/s. **5**

(b) Draw a 16 QAM constellation diagram. **5**

(c) Derive a throughput expression for slotted Aloha. What is its vulnerable time ? Explain. **3+2**

(d) Write the distance vector routing algorithm to compute a minimum cost among the nodes with the help of an example. **8**

(e) Find CRC for data polynomial $X^9 + X^8 + X^6 + X^5 + X^2 + 1$ with generator polynomial $X^3 + X^2 + 1$ **7**

(f) Explain sliding window protocol with an example. **5**

(g) What is the shortcoming of the Diffie - Hellman algorithm ? Explain. **5**

2. (a) What is microwave transmission ? Describe its characteristics and applications. 5

(b) Compare the Go-Back N ARQ protocol with selective Repeat ARQ 5

(c) Why circuit switching cannot be used for packet transmission ? Discuss. 5

(d) For n devices in a network, what is the number of cable links, number of full duplex channels for a mesh topology ? 5

3. (a) (i) Find the class of the following IP address : 2

- 130 . 15 . 6 . 8
- 245 . 33 . 5 . 8

(ii) Find the net id and host id of the following IP addresses. 3

- 114 . 35 . 2 . 7
- 133 . 57 . 6 . 8
- 207 . 34 . 54 . 12

(b) Explain the binary exponential backoff algorithm. 5

(c) What is silky windows syndrome ? What are its proposed solutions ? 5

(d) Compare the encryption process of electronic code book and cipher block chaining. 5

4. (a) Discuss any two benefits of SSL. 5

(b) Explain the following TCP/IP header fields : 10

- Acknowledgement Number
- Window Size
- URG and RST
- Total Length
- Identification

(c) How does BGP resolve count to infinity problem ? 5

5. (a) Explain the operation of hierarchical routing though illustration. 5

(b) What is spread spectrum ? What are the two types of spread spectrum used in wireless data network ? Elaborate. 5

(c) What are the advantages of multistage switching ? Illustrate though an example. 5

(d) Why is ADSL called asymmetric and why is it not kept symmetric ? 5