Roll No.	
Paper Code: MCA-511	

MCA
FIFTH SEMESTER EXAMINATION, 2016-2017
COMPUTER NETWORKS

[Time: 3 Hours] [Total Marks: 100]

Note: Attempt ***ALL*** questions. Assume suitable data, if required. All question carry equal marks.

1. Attempt any *five* parts of the following: - **(4x5=20)**

(a) What are two reasons for using layered protocols?
(b) Television channels are 6 MHz wide. How many bits/sec can be sent if four-level digital signals are used? Assume a noiseless channel.
(c) What is the essential difference between message switching and packet switching?
(d) A cable TV system has 100 commercial channels, all of them alternating programs with advertising. Is this more like TDM or like FDM? Justify your answer?
(e) Enumerate the difference between distributed and client-server based system ?
(f) Why do we need to modulate a data signal?
(g) What is the main difference between TCP and UDP?

2. Attempt any *two* parts of the following: - **(10x2=20)**

(a) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is $x^3 + 1$. Show the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end.
(b) Compare and Contrast CSMA/CD with CSMA/CA
(c) Consider the delay of pure ALOHA versus slotted ALOHA at low load. Which one is less? Explain your answer.

3. Attempt any *two* parts of the following: - **(10x2=20)**

(a) A computer on a 6-Mbps network is regulated by a token bucket. The token bucket is filled at a rate of 1 Mbps. It is initially filled to capacity with 8 megabits. How long can the computer transmit at the full 6 Mbps?

(b) Explain Link State routing with the help of an example?

(c) A network on the Internet has a subnet mask of 255:255:240:0. What is the maximum number of hosts it can handle?

4. Attempt any *two* parts of the following: - **(10x2=20)**

(a) Describe Nagle's and Clark's algorithm in transport layer. Give a potential disadvantage when Nagle's algorithm is used on a badly-congested network.

(b) Explain the difference in TCP and UDP? Draw & explain their frame formats as well.

(c) Explain TCP window congestion control. If TCP can identify a packet loss reason due to congestion or error? Explain.

4. Attempt any *two* parts of the following: - **(10x2=20)**

(a) Write a brief note on network security.

(b) Explain the need of a browser in accessing web pages on internet?

(c) What is the basic difference between POP3 and IMAP?