

# END TERM EXAMINATION

FIFTH SEMESTER [MCA] DECEMBER 2007

**Paper Code: MCA309**

**Subject: Advanced Computer Networks**

**Time: 3Hours**

**Maximum Marks: 60**

**Note: Attempt any five questions including Q.1 and selecting one question from each unit.**

**Q.1** (a) A bit stream 11011001 is transmitted using the standard CRC method. The generator polynomial is  $x^3+1$ .

- i. Show the actual bit transmitted.
- ii. Suppose the fourth bit from left is inverted during transmission. Show that this error is detected at the receiver's end.

(b)

- i. If a binary signal is sent over a channel whose signal to noise ratio is 3:1. What is the appropriate number of levels of the signal?
- ii. In part a) above, if the channel bandwidth is 3KHz, what is the maximum achievable bit rate?

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

(d) Describe the working of NAT.

## UNIT-I

**Q.2**

(a) Give two situations each, in which the network might use

- (i) Error-correcting code instead of error detection and retransmission. Give reason also.
- (ii) Error-detection and retransmission instead of Error-correcting code. Give reason also.

(b) Give the differences between using a dial-up line and ADSL for a PC to connect and use the Internet.

**Q.3**

(a) A large population of ALOHA users manage to generate 50 request/sec, including both originals and retransmission. Time is slotted in units of 40 msec.

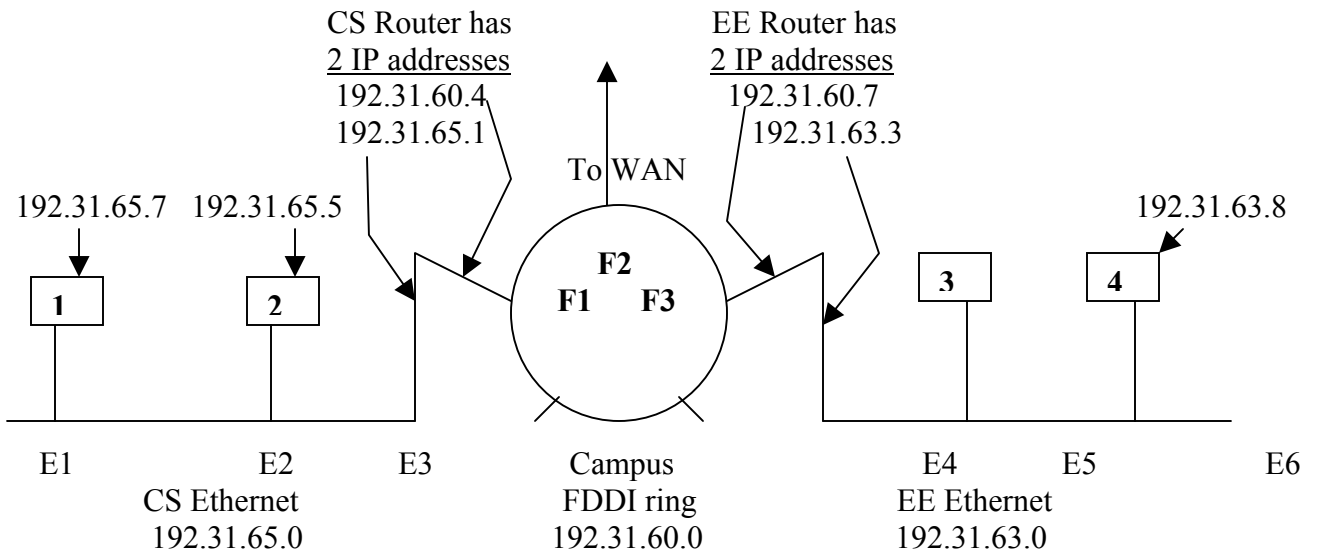
- (i) What is the chance of success on the first attempt?
- (ii) What is the probability of exactly k collision and then a success?

(b) Answer the following briefly:

- (i) Why do we need "framing"?
- (ii) What kinds of error are controlled by the Error control mechanisms at the data link layer?

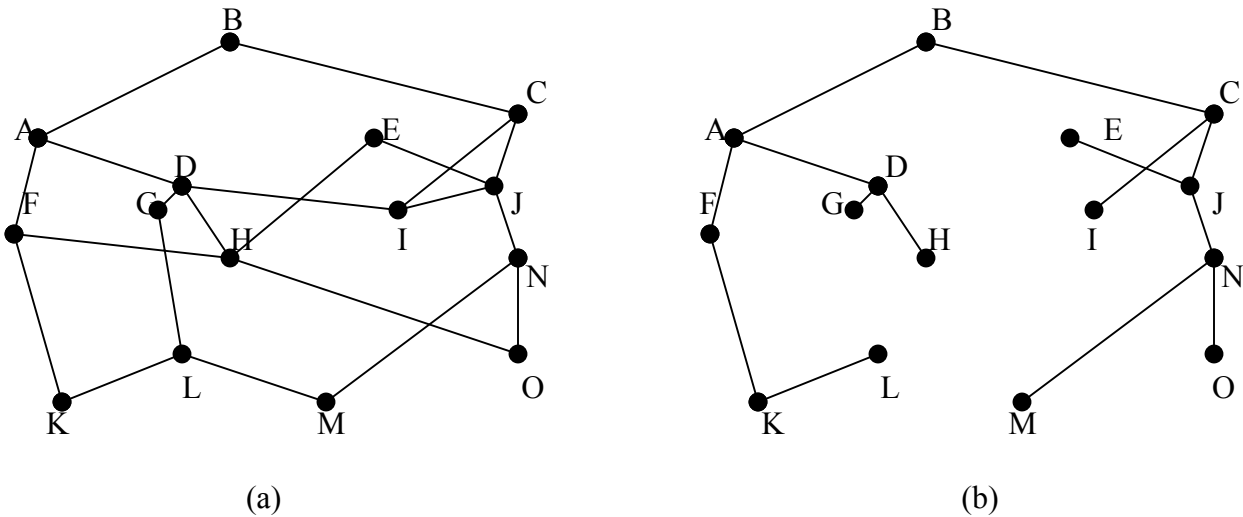
**UNIT-II**

**Q.4 (a)** Consider the following network.



How does ARP protocol work when a packet is to be sent

- (i) From host E2 to host E1.
  - (ii) From host E2 to host E5.
- (b) Consider the following subnet.



How many packets are generated by broadcast from B, using sink tree?

**Q.5 (a)** A large number of consecutive IP addresses are available starting at 198.16.0.0. Suppose that four Organization A,B,C,D request 4000, 2000, 4000,8000 addresses, respectively, and in the following format:

Organization	First address	Last address	Size	Mask w.x.y.z/s Notation

Show the available free blocks also. Can these addresses be aggregated in one single entry? If yes, give the aggregated entry (mask). If no, justify your answer

- (b) Now suppose another organization E request 4000 addresses. Can it be assigned one of the available one of the available blocks in the answer of part a. If no, why not? If yes, then suppose that there is a separate outgoing line for E in a router with aggregate entry. Do we need to split the aggregate entry now and form new entries or is there an alternate way of handling the packets to E? Suggest and explain.

### UNIT-III

- Q.6** (a) What is server farm? What is TCP handoff?  
(b) Differentiate between TCP and UDP.

**Q.7** Explain the three-way handshake used to establish a reliable connection at the transport layer.

### UNIT-IV

**Q.8** (a) Consider the following scenario. You send a mail to your friend at address.  
[abcd@yahoo.com](mailto:abcd@yahoo.com)

- (i) Is your machine running SMTP client/server or both none? Is your machine running POP3 client/server or both or none?
- (ii) Where is your mail stored once it is sent?
- (iii) Give the steps involved when your friend reads the mail.

(b) Differentiate between

- (i) Stream cipher and Block cipher
- (ii) Encryption using Symmetric Keys and Encryption using Public keys.

**Q.9** Expand the following abbreviations and explain their functions

- (a) DNS
- (b) WWW
- (c) SMTP
- (d) POP3
- (e) HTTP