

CS/B.TECH/ECE/ODD SEM/SEM-7/EC-703C/2016-17

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Paper Code : EC-703C

COMPUTER NETWORKS

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) The total number of links required to connect n devices using Mesh topology is

- a) 2^n b) $n(n+1)/2$
c) $n(n-1)/2$ d) n^2 .

ii) Flow control is the responsibility of the

- a) Data link layer b) Transport layer
c) both of these d) none of these.

iii) Which orbit has the highest altitude ?

- a) LEO b) GEO
c) MEO d) HEO.

iv) A router

- a) forwards a packet to all outgoing links, except the link upon which the packet is originated.
b) determines on which outgoing link a packet is to be forwarded
c) forwards a packet to all outgoing links.
d) forwards a packet to some outgoing links.

v) A subset of a network that includes all the routers but contains no loops is called

- a) spanning tree
b) spider structure
c) spider tree
d) none of these.

vi) ICMP resides at the same layer as which of the following protocols mentioned below ?

- a) TCP b) UDP
c) IP d) ARP.

vii) What is data encryption standard (DES) ?

- a) Block cipher b) Stream cipher
- c) Bit cipher d) None of these.

viii) Which detection method can detect a single bit error ?

- a) Simple parity check
- b) Two dimensional parity check
- c) CRC
- d) All of these.

ix) Which of the following is a valid host for network 192.168.10.32/28 ?

- a) 192.168.10.39 b) 192.168.10.47
- c) 192.168.10.14 d) 192.168.10.54.

x) Pure ALOHA has a maximum efficiency of

- a) 18% b) 37%
- c) 10% d) none of these.

GROUP – B

(Short Answer Type Questions)

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

2. a) How does Manchester encoding differ from differential Manchester encoding ?

b) Draw the following encoding scheme for the bit stream 0001110101

- i) NRZ-I
- ii) Manchester coding
- iii) Differential Manchester coding. $2 + 3$

3. What are the advantages and disadvantages of ATM based network ?

4. What do you mean by random access and controlled access ? What are the differences between ALOHA and slotted ALOHA multiple access techniques ? $3 + 2$

5. State the differences among Bridge, Switch and Hub.

6. a) What is the purpose of subnetting ? Find the netid and the hostid of the following IP addresses :

- i) 19.34.21.5
- ii) 220.34.8.9

- b) A network has subnet mask 255.255.255.224
Determine the maximum number of hosts in this network.

Also determine the broadcast address of this network. $1 + 2 + 2$

GROUP - C

(Long Answer Type Questions)

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

7. a) Discuss briefly IGMP & ICMP.
b) What is Bit Rate ? What is Baud Rate ?
An analog signal carries 4 bits in each signal unit.
If 1000 signal units are sent per second, find the Baud rate and Bit rate.
c) State the differences between OSI model and TCP/IP model. $5 + (1 + 1 + 3) + 5$
8. a) Distinguish between adapting routing and fixed routing. Why is adaptive routing preferred over fixed routing ?
b) Differentiate between Link State and Distance Vector routing algorithms.

- c) How are 'iterative query resolution' and 'recursive query resolution' different from each other in the context of DNS ? Explain with example.

- d) What do you understand by data privacy ? How can authentication, integrity and non-repudiation be implemented by digital signature ? $4 + 3 + 4 + 4$

9. a) What is congestion ?
b) Why does congestion occur ?
c) Explain Leaky Bucket algorithm for congestion control.
d) State the basic difference between TCP and UDP.
e) Compare IPv4 and IPv6. $2 + 2 + 4 + 3 + 4$
10. a) Discuss briefly Go-Back-N ARQ and Selective Repeat ARQ.
b) State briefly the function of FTP in networking.
c) Discuss the advantages and disadvantages of Fibre Optic cable. $5 + 5 + 5$

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

- a) SMTP
 - b) IPv6.
 - c) ISDN
 - d) Token Ring
 - e) OSPF.
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