

M.Sc. 4th Semester Examination, 2024

ELECTRONICS

(Computer Network and Security)

PAPER – ELC-404C

Full Marks : 50

Time : 2 hours

Answer all questions

The figures in the right hand margin indicate marks

Candidates are required to give their answers in their own words as far as practicable

GROUP—A

Answer any four of the following questions : 2×4

1. Clearly explain the differences between physical topology and virtual topology giving one example of each. 1 + 1

2. What is multiplexing ? 2
3. Name the layers in the ISO/OSI model. 2
4. What are the necessary components of data communication ? 2
5. Distinguish between the bit rate and baud rate of a communication channel. If a channel transmits data at 1000 bauds using 10 different signal levels, what is its bit rate ? 1 + 1
6. Differentiate between circuit switching and packet switching with respect to the following parameters : 1 + 1
- (i) Resource utilization
- (ii) Delay.

GROUP - B

Answer any **four** of the following questions :

7. Compare LAN, MAN and WAN. 4×4
4

8. Indicate in which layer(s) the following internetworking devices are used to connect two computer networks :

(i) Hub

(ii) Bridge

(iii) Switch

(iv) Router

1 + 1 + 1 + 1

9. Compare and contrast the following techniques used to modulate digital signals for transmission over long distances.

(i) FDMA

(ii) CDMA

2 + 2

10. Explain about the data rates in PSTN. 4

11. Compare 1G, 2G, 2.5G and 3G technologies. 4

12. List advantages and drawbacks (if any) of any two of the following network topologies.

(i) Bus

(ii) Ring

(iii) Tree

(iv) Hybrid.

2 + 2

GROUP – C

Answer any **two** of the following questions :

8 × 2

13. Write short notes on CDMA and ISDN.

4 + 4

14. Explain what is meant by the following tasks required in a computer network and indicate the protocol layer(s) responsible for addressing each of these tasks in OSI and TCP/IP protocol suites.

(i) Flow control

(ii) Error control

(iii) Addressing

(iv) Routing.

2 + 2 + 2 + 2

15. Explain GSM architecture with proper diagram.

8

16. (a) List at least two type of control signals that are exchanged between a subscriber and a circuit switched network and their functions.

(b) Describe the following signaling techniques used in circuit-switched networks and list their characteristics : (i) Inchannel/ Inband signaling, (ii) Out-of-band signaling (iii) Common channel signaling.

(c) Differentiate between forward error correction (FEC) and backward error correction (also known as automatic repeat request or ARQ).

(d) ARQ is commonly used in data transmission over wired networks. However, FEC is the preferred method of error handling in wireless networks and in satellite communication. Explain why it is so. 2 + 2 + 2 + 2

[Internal Assessment – 10 Marks]
