

**BACHELOR OF COMPUTER  
APPLICATIONS (B. C. A.) (REVISED)**

**Term-End Examination**

**June, 2024**

**BCS-041 : FUNDAMENTALS OF  
COMPUTER NETWORKS**

*Time : 3 Hours*

*Maximum Marks : 100*

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**Note :** (i) *Question no. 1 is compulsory. Attempt any **three** questions from the rest.*

(ii) *Use of calculator is allowed.*

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1. (a) Compare parallel and serial communication. Why is serial data transmission faster than parallel data transmission ? Explain. 5

(b) Compare DHCP and SNMP. Give importance of DHCP and SNMP for the application layer of TCP/IP model. 5

- (c) Discuss the role of switch as an inter-networking device. Compare layer-2 switch with layer-3 switch. 5
- (d) What is multiplexing ? Briefly discuss the importance of multiplexing. List the basic multiplexing techniques. 5
- (e) What is the function of Datalink layer ? Briefly discuss the role of two sub-layers of Datalink layer. 5
- (f) What is distance vector routing ? Briefly discuss the problem of distance vectors routing. 5
- (g) What is stream cipher ? Give *two* advantages and *two* disadvantages of stream cipher. 5
- (h) Differentiate between Symmetric and Asymmetric cryptography. 5
2. (a) Discuss the term 'Cyclic Redundancy Check (CRC)'. Find CRC, if the message is  $X^7 + X^5 + 1$  and the generator polynomial is  $X^3 + 1$ . 10

- (b) Differentiate between pure ALOHA and slotted ALOHA. If the throughput of pure ALOHA is  $S = G e^{-2G}$ , show that the maximum throughput ( $S_{\max}$ ) is 0.184. 10
3. (a) What is classful addressing ? How is it different from classless addressing ? How does classless addressing result in the decrease of table size ? Given the network address 17.0.0.0, find the class, the block and the range of address. 10
- (b) Explain RSA algorithm with suitable example and block diagram. 10
4. (a) Differentiate between following : 5+5
- (i) ICMP and IGMP
- (ii) Token bucket algorithm and leaky bucket algorithm.
- (b) Briefly discuss the functions of various layers involved in TCP/IP model. Also mention the protocols defined under each layer. 10

5. Write short notes on the following :  $4 \times 5 = 20$

- (a) MD5 Digest
- (b) Components of address field in the Frame Relay Protocol Data Unit
- (c) GSM Architecture
- (d) Frame Relay
- (e) 3-way handshake protocol