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BCS–041

BACHELOR OF COMPUTER APPLICATIONS

(BCA) (REVISED)

Term-End Examination

December, 2025

BCS-041 : FUNDAMENTALS OF COMPUTER NETWORKS

Time : 3 Hours *Maximum Marks : 100*

Note : *Question No.* ***1*** *compulsory. Attempt any* ***three*** *questions from the rest. Use of calculator is allowed.*

1. (a) How does synchronous transmission differ from asynchronous transmission ? Give suitable example for each. 5

(b) What is frequency division multiplexing ? Give the advantages and disadvantages of frequency division multiplexing. 5

(c) What are gateways ? Explain the importance of gateways in networking. 5

(d) Explain the working of ARP (Address Resolution Protocol) with the help of a suitable diagram. 5

(e) Justify the statement, "Slotted ALOHA achieves double efficiency than pure ALOHA." 5

(f) Differentiate between 'Public-key' and 'Private-key' cryptography. 5

(g) Explain count to infinity problem with the help of an example. 5

(h) Define angle modulation. Give its types. Also, discuss the limitation of angle modulation. 5

2. (a) Assume message M = 1010101010 bits and generaton G = 10001 bits. Explain, how CRC (Cyclic Redundancy Check) is used for error detection using the given message bits and generaton bits. 10

(b) Discuss distance vector routing using a subnet topology. Also, discuss the different metrics used in distance vector routing algorithm. 10

3. (a) What is MD5 ? Write and explain the steps of MD5 algorithm. 10

(b) Write the role of data link layer in OSI model. Explain the services and functions provided by data link layer. Also, give the importance of its sub-layers. 10

4. (a) Explain X.25 architecture with the help of a suitable diagram. How does X.25 architecture differ from frame relay ? Give the advantages of frame relay over X.25 architecture. 10

(b) Differentiate between IPv4 and IPv6. Also, discuss the need of IPv6. Find the classes of the following IPv4 addresses : 10

(i) 193.14.56.22

(ii) 226.11.14.27

(iii) 134.11.27.13

(iv) 252.5.15.111

5. Write short notes on the following : 4×5=20

   (i) Leaky Bucket Algorithm

   (ii) Multimode Optical Fiber

   (iii) OSI Model

   (iv) CSMA/CD

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