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# BCS–041

## BACHELOR OF COMPUTER APPLICATIONS (BCA) (REVISED)

## Term-End Examination

## December, 2024

### BCS-041 : FUNDAMENTALS OF COMPUTER NETWORKS

*Time : 3 Hours* *Maximum Marks : 100*

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

1. (a) Compare digital and analog communications. Which type of communication either digital or analog is better for computers ? Justify. 5

   (b) What are 'Hash functions' ? Why are they called 'one-way functions' ? Explain. 5



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(c) Discuss the term 'Quality of Services (QoS)' for computer networks. Briefly discuss any *one* technique to improve QoS. 5

(d) What is Block-cipher ? Give *two* advantages and *two* disadvantages of Block cipher. 5

(e) What is frequency modulation ? Give *two* advantages and *two* disadvantages of frequency modulation. 5

(f) What is Random Access Protocol ? Compare throughput of pure ALOHA and slotted ALOHA. 5

(g) What is round robin technique for data transmission ? How does polling differ from token passing ? 5

(h) Compare BOOTP and DHCP. Discuss the importance of BOOTP and DHCP for the application layer of TCP/IP. 5



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2. (a) Explain the term 'Cyclic Redundancy Check (CRC)'. Find CRC for the data polynomial $X^5 + X^4 + X^2 + 1$ with generator polynomial $X^3 + 1$. 10

   (b) Explain the working of 3-way handshake used in TCP, with the help of a suitable diagram. 10

3. (a) Write step by step procedure for working of link state routing protocol. Also, compare it with the distance vector routing. 10

   (b) Explain the working of ARP, using a diagram. How does ARP differ from RARP ? Explain. 10

4. (a) Briefly discuss the following types of multiplexing : 2.5×4=10

   (i) Frequency division multiplexing

   (ii) Time division multiplexing

   (iii) Code division multiplexing

   (iv) Space division multiplexing



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(b) Differentiate between the following : 5×2=10

(i) Symmetric and Asymmetric cryptography

(ii) Transmission Control Protocol and User Datagram Protocol

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

(a) Silly Window syndrome

(b) X.25 Architecture

(c) IPv6

(d) Adaptive Routing Algorithm

(e) ATM service classes

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