Gandhi Institute of Engineering and Technology University, Odisha, Gunupur
(GIET University)

B. Tech (Sixth Semester – Regular/Supplementary) Examinations, April 2025

21BECPE36011 –Data Communications and Networking
(ECE)

Time: 3 hrs   Maximum: 70 Marks

Answer ALL questions
(The figures in the right-hand margin indicate marks)

PART – A   (2 x 5 = 10 Marks)

		CO #	Blooms Level
Q.1.	Answer *ALL* questions		
a.	Name the five components of data communication.	CO1	K1
b.	Simplify the following IPv6 address: 0000:0000:0000: 0000:0000:0000: 0000:0001	CO2	K3
c.	What is the purpose of DNS in networking?	CO3	K2
d.	Find the minimum hamming distance of the coding scheme:	CO4	K3

Data words	Codewords
00	00000
01	01011
10	10101
11	11110

		CO #	Blooms Level
e.	What is the purpose of the Start Frame Delimiter (SFD)?	CO3	K1

PART – B   (15 x 4 = 60 Marks)

Answer *all* the questions

		Marks	CO #	Blooms Level
2. a.	What is data flow in communication systems? Briefly explain simplex, half-duplex, and full-duplex modes with examples.	8	CO1	K2
b.	What is UDP? Explain its operation.	7	CO3	K2
	(OR)			
c.	A sender is using the Go-Back-N ARQ protocol with a window size of 4 to transmit 10 packets (numbered 0 to 9) to a receiver. Assume that every 4th packet transmitted (not sequence number) is lost during the initial transmission. Calculate the total number of transmissions required to successfully deliver all packets to the receiver.	8	CO4	K4
d.	What is Dynamic DNS (DDNS)? How is it different from the traditional DNS?	7	CO3	K2
3.a.	Describe the working of Stop-and-Wait ARQ protocol. Also discuss its limitations and how Go-Back-N ARQ improves upon it.	8	CO4	K2
b.	Explain the working of ARP and RARP with the help of timing diagrams.	7	CO3	K3
	(OR)			
c.	Include a diagram to show the communication between the TELNET client and server. Why is NVT important in TELNET communication?	8	CO3	K3
d.	Define DSSS and explain how it achieves bandwidth spreading.	7	CO5	K2
4.a.	Explain leaky bucket and token bucket algorithm.	8	CO4	K3
b.	What is routing? Using distance vector routing algorithm, calculate the shortest path in the following given network.	7	CO4	K4
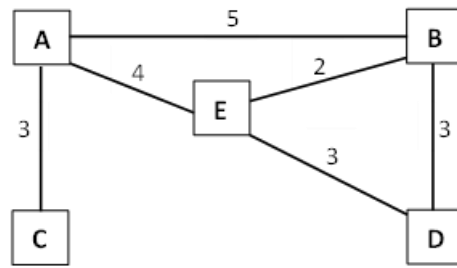
<div style="text-align:center">(OR)</div>

c.	Differentiate between connection-oriented and connectionless services. At which OSI layers are these services provided? Illustrate with examples.	8	CO3	K2
d.	With the help of timing diagrams, explain how Slotted ALOHA improves the performance over Pure ALOHA. Also, calculate and compare the throughput of both protocols.	7	CO5	K4
5.a.	What is Cyclic Redundancy Check (CRC)? Describe the steps involved in generating and checking CRC with a suitable example.	8	CO4	K3
b.	Explain the concept of process-to-process communication in the Transport Layer. How does it differ from host-to-host communication?	7	CO3	K2

<div style="text-align:center">(OR)</div>

c.	Write short notes on the following:
	   i. Time Division Multiplexing (TDM)
	   ii. Wavelength Division Multiplexing (WDM)
		8	CO5	K2

d.	What is the World Wide Web (WWW)? Explain its architecture.	7	CO3	K2

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