

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2026

B.Tech-VI Semester (ECE/Minor ECE)

COURSE CODE (CREDITS):18B11EC611(3)

MAX. MARKS: 35

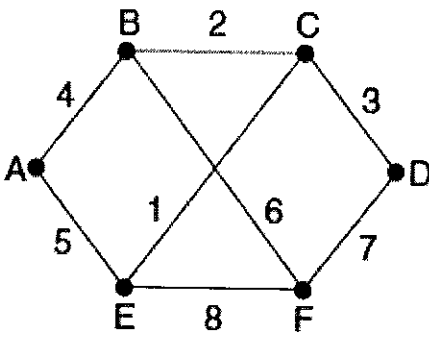
COURSE NAME: Wireless and Data Communication

COURSE INSTRUCTOR: Dr. Shweta Pandit

MAX. TIME: 2 Hours

*Note: (a) All questions are compulsory.**(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems**(c) Use of calculators is allowed*

Q.No	Question	CO	Marks
Q1.	a) An upper-layer packet is split into 20 frames, each of which has 70% chance of arriving undamaged. If no error control is done by the data link protocol, how many times must the message be sent on average to get the entire thing through?	2	[1]
	b) Explain with example the different methods of Framing in Data-Link layer.		[3]
	c) A bit stream 1010001 is to be transmitted using standard CRC method. The generator polynomial is $x^3 + 1$. Find the final transmitted bit pattern using CRC method.		[3]
Q2.	a) A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in units of 40 msec. (i) What is the chance of success on the first attempt? (ii) What is the probability of exactly k collisions and then a success? (iii) What is the expected number of transmission attempts needed?	4	[3]
	b) Compare and contrast among the CSMA/CD and CSMA/CA protocols. Give the examples of networks where these protocols are employed. Where does the role of RTS and CTS packets comes into picture in above two protocols and why?		[4]
Q3.	a) Compare IPv4 and IPv6 protocols header format.	6	[1]
	b) Discuss the formation of Bluetooth network		[3]
	c) Provide the IEEE 802.11 protocol stack structure along with its Frame Format.		[3]

Q4.	a) Give the formation of Link state Packets in Link State Routing protocol for the Figure 1 network. b) Consider the network of Figure 1. Distance vector routing is used, and the following vectors have just come in to router C: from B: (5, 0, 8, 12, 6, 2); from D: (16, 12, 6, 0, 9, 10); and from E: (7, 6, 3, 9, 0, 4). The cost of the links from C to B, D, and E, are 6, 3, and 5, respectively. What is C's new routing table? Give both the outgoing line to use and the cost.  Figure 1	5	[3] [4]
Q5.	a) Why the contention slot duration is 2τ in case of CSMA/CD protocol, where τ is the time for a signal to propagate between the two farthest stations? b) Give the mathematical formulation of the channel utilization versus load for different types of CSMA protocols along with graphical representations.	4	[2] [5]