JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT TEST -3 EXAMINATION- 2025

B. Tech-VI Semester (ECE)

COURSE CODE (CREDITS):18B11EC611(3)

MAX. MARKS: 35

COURSE NAME: Wireless and Data Communication

COURSE INSTRUCTORS: Dr. Shweta Pandit

MAX. TIME: 2 Hour

Note: (a) All questions are compulsory.

(b) The candidate is allowed to make Suitable numeric assumptions wherever required

for solving problems

Q.No	Question	CO	Marks
Q1.	a) Discuss the concept of redundancy in error detection and correction. The following data fragment occurs in the middle of a data stream for which the byte stuffing algorithm is used: A B ESC C ESC FLAG FLAG D. What is the output after stuffing?	4	3
	 b) Define Hamming distance and minimum Hamming distance. Find the minimum Hamming distance for the following cases: (i) Detection of two bits in error. 		5
	(ii) Correction of two bits in errors. (iii) Detection of 3 errors or correction of 2 errors. Suppose a 12-bit Hamming code whose hexadecimal value is 0xE4F arrives at a receiver. What was the original value in hexadecimal? Assume that not more than 1 bit is in error.		
Q2.	Define the concept of distance vector routing algorithm. Show the process of routing table updation by considering an example of a network. What is the count to infinity problem that exist in this routing algorithm?	6	4+1
Q3.	A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is $x^3 + 1$. Show the actual bit string transmitted. Suppose that the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end. Give an example of bit errors in the bit string transmitted that will not be detected by the receiver.	4	5
Q4.	Give the description of Bluetooth radio layer along with the scatternet formation in Bluetooth network. Also a Bluetooth device can be in two piconets at the same time. Is there any reason why one device cannot be the master in both of them at the same time?	5	5
Q5.	a) What is carrier sense multiple access (CSMA) protocol? Differentiate among 1-persistent, p-persistent, and non-persistent protocols.	5	2
	 b) 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? 		3
Q6.	 (iii) What is the expected number of transmission attempts needed? a) Define the various interframe spacing existing in IEEE 802.11 Wireless LAN network. Draw and explain different components of IEEE 802.11 Wireless LAN 	6	4
	protocol stack. b) Provide the specifications and application of WiMax and Zigbee networks.		3