UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2022

Course: Data Communication & Computer Networks **Semester: IV**
Program: B. Tech CSE (All Specializations) **Time: 03 hrs.**
Course Code: CSEG 2009 **Max. Marks: 100**

SECTION A

S. No.		Marks	CO
Q 1	Determine the total number of links needed for an N node connected as mesh topology, star topology, ring topology, and bus topology.	**4**	**CO1**
Q 2	If the data link layer can detect errors between hops, why do you think we need another checking mechanism at the transport layer?	**4**	**CO4**
Q 3	Compare space-division and time-division switches.	**4**	**CO1**
Q 4	What is the propagation time if the distance between the two points is 12,000 km? Assume the propagation speed to be 2.4 × 108 m/s in the cable.	**4**	**CO1**
Q 5	List four differences between distance vector routing and link-state routing.	**4**	**CO3**
	SECTION B		
Q 6	Explain the following terms in the Go-Back-N ARQ protocol using a flow diagram: a) Sequence Numbers b) Sender's and Receiver's window size c) Timers d) Acknowledgement	**10**	**CO2**
Q 7	Compare and contrast CSMA/CD with CSMA/CA.	**10**	**CO2**
Q 8	Explain the OSI layer in detail with a suitable diagram with the functions of each layer.	**10**	**CO1**
Q 9	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. **OR** Given the data word 1010011110 and the divisor 10111, a) Show the generation of the codeword at the sender site (using binary division). b) Show the checking of the codeword at the receiver site (assume no error).	**10**	**CO2**
	SECTION-C		
Q 10	We have a big single network having IP Address 200.1.2.0/24. We want to do subnetting and divide this network into 4 subnets. Identify the following: a) IP Address of each subnets, b) Total number of IP Addresses in each subnet, c) Total number of hosts that can be configured in each subnet, d) Range of IP Addresses in each subnet, e) Broadcast Address in each subnet.	**20**	**CO3**
Q 11	Write short notes on:		**CO4**