

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2025

B.Tech-VI Semester (CSE/IT/ECE/CE/BT/BI)

COURSE CODE (CREDITS): 3

MAX. MARKS: 15

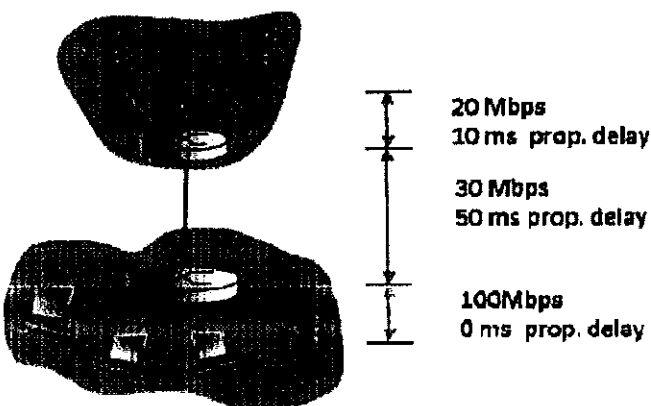
COURSE NAME: Computer Networks

COURSE INSTRUCTORS: Hari Singh, Nancy, Kuntal, Rakesh Kanji, Praveen Modi

MAX. TIME: 1 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)	For n devices in a network, what is the number of cable links required for a mesh, ring, bus, and star topology?	CO1	1
(b)	Briefly describe the jobs and responsibilities of Physical Layer in the TCP/IP Model.	CO1	3
Q2(a)	Identify the five components of a data communications system?	CO1	1
(b)	Which line coding method among Unipolar and Polar is inefficient for transmitting long sequences of 1's or 0's? Which method is best suited for handling such sequences? What issues can arise when sending continuous 1's or 0's in a transmission?	CO2	2
Q3	<p>Consider the scenario in the figure, in which (from the bottom up) three hosts and a local logging server (that stores information that is sent to it) are connected to a router and to each other by a 100 Mbps link, with an near-zero ms propagation delay. That router in turn is connected to another router over a 30 Mbps link with a 50 ms propagation delay, and that latter router is connected to two remote logging servers, each over a 20 Mbps link with a 10 ms propagation delay.</p>  <p>Suppose a host sends a logging message directly to one of the remote logging servers. The logging message is 10K bits long. What is the</p>	CO2	3

	end-to-end delay from when the logging message is first transmitted by the host to when it is received at the remote server? Assume that the request goes directly to the server, that there are no queueing delays, and that node (router) packet-processing delays are also zero.																				
Q4	Ten 9600-bps lines are to be multiplexed using TDM. Ignoring overhead bits in the TDM frame. Assuming that the average TDM link utilization upto 80% and each TDM link is busy 50% of the time, what is the capacity required for statistical TDM?	CO2	2																		
Q5	Five equal-size datagrams belonging to the same message leave for the destination one after another. However, they travel through different paths as shown in Table. <table border="1"><thead><tr><th>Datagram</th><th>Path Length (KM)</th><th>Visited Switches</th></tr></thead><tbody><tr><td>1</td><td>3200</td><td>1, 3, 5</td></tr><tr><td>2</td><td>11700</td><td>1, 2, 5</td></tr><tr><td>3</td><td>12200</td><td>1, 2, 3, 5</td></tr><tr><td>4</td><td>10200</td><td>1, 4, 5</td></tr><tr><td>5</td><td>10700</td><td>1, 4, 3, 5</td></tr></tbody></table> <p>We assume that the delay for each switch (including waiting and processing) is 3, 10, 20, 7, and 20 ms respectively. Assuming that the propagation speed is <math>2 \times 10^8</math> m/s, find the order the datagrams arrive at the destination and the delay for each. Ignore any other delays in transmission.</p>	Datagram	Path Length (KM)	Visited Switches	1	3200	1, 3, 5	2	11700	1, 2, 5	3	12200	1, 2, 3, 5	4	10200	1, 4, 5	5	10700	1, 4, 3, 5	CO2	3
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