Roll No:

BTECH
(SEM. VI) THEORY EXAMINATION 2025-26
COMPUTER NETWORKS

TIME: 3 HRS **M.MARKS: 70**

Note: Attempt all Sections. In case of any missing data: choose suitably.

SECTION A

1. Attempt *all* questions in brief. **02 x 7 = 14**

Q no.	Question
a.	Define network topology and mention one advantage of star topology.
b.	Differentiate OSI and TCP/IP models in two points.
c.	Calculate propagation delay for 2000 km link if speed is 2×10^8 m/s.
d.	Define Shannon capacity theorem.
e.	What is multiplexing? Name two types.
f.	Define PPP and its main function.
g.	What is congestion control?

SECTION B

2. Attempt any *three* of the following: **07 x 3 = 21**

Q no.	Question
a.	Explain OSI layers and compare them with TCP/IP layers.
b.	A channel has bandwidth 4 kHz and SNR 30 dB; compute channel capacity.
c.	Compare FDM, TDM, and WDM with suitable examples.
d.	Explain error detection using CRC with sample binary data.
e.	Discuss routing algorithms and shortest path calculation.

SECTION C

3. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question
a.	Draw and explain different network topologies with performance comparison.
b.	A modem transmits 2400 bps: calculate transmission time for 10 KB file.

4. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question
a.	Compare guided and unguided media based on speed and attenuation.
b.	A signal frequency is 10 MHz; calculate wavelength in free space.

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5. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question
a.	Explain packet switching and solve delay for 5 packets over 4 hops.
b.	Describe flow control using Stop-and-Wait protocol with example.

6. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question
a.	Explain PPP layers and authentication methods.
b.	Compare ISDN and broadband ISDN with service features.

7. Attempt any *one* part of the following: **07 x 1 = 07**

Q no.	Question
a.	Explain Dijkstra's algorithm and compute shortest route for a network.
b.	Differentiate router, bridge, repeater, and gateway with applications.

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