



Paper ID : 261760

Printed Page: 1 of  
Subject Code: BCS603

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 $2 \times 10^8$ 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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