

PECS12 - Data Communication and Networking

P. Pages : 1

Time : Three Hours



GUG/W/24/10979

Max. Marks : 70

- Notes :
1. All questions carry equal marks.
 2. Attempt **any five** questions.
 3. Assume suitable data wherever necessary.
 4. Illustrate your answers wherever necessary with the help of neat sketches.

1. A) Describe the OSI model and its seven layers. Discuss the function of each layer in the context of data communication. **7**
B) Discuss the TCP/IP protocol suite and its significance in modern networking. **7**
2. A) Describe how switching operates within a network and differentiate between circuit switching and packet switching. **7**
B) Given a scenario with a specified number of users and devices, design a basic network using switches and routers. Justify your choices. **7**
3. A) Explain IPV4 header format in detail. **7**
B) Explain how is WDM similar to FDM? How are they different? **7**
4. A) Explain three different ways in which the CRC algorithm can be described. **7**
B) Compare and contrast the different types of ARQ protocols (e.g., Stop-and-Wait ARQ, Go-Back-N ARQ, Selective Repeat ARQ). Discuss the advantages and disadvantages of each. **7**
5. A) Discuss the role of Signaling System No. 7 (SS7) in Common Channel Signaling. **7**
B) What are the three frame type supported by HDLC? Describe each. **7**
6. A) Draw and explain three stage network. Also calculate the total number of cross points required. **7**
B) Explain the various layers of fiber distributed data interface. (FDDI). **7**
7. A) Explain how collision detection works in CSMA/CD. What mechanisms are in place to handle collisions, and how does this affect network performance? **7**
B) Discuss the functions of the LLC sublayer, including framing, error detection, and flow control. How does LLC facilitate communication between different network protocols? **7**
8. A) Detail the structure of an ATM cell. What are the key components, and how does the fixed cell size contribute to ATM's performance? **7**
B) Explain the role of firewalls in network security. Discuss the different types of firewalls and their functions. **7**
