22232

3 Hours / 70 Marks Seat No. | | | | | | | | |

Instructions : (1) All Questions are *compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Assume suitable data, if necessary.

(5) Use of Non-programmable Electronic Pocket Calculator is permissible.

(6) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. Attempt any FIVE of the following : **2 × 5 = 10**

(a) State synchronous and asynchronous communication.

(b) Define quantization error and quantization Noise.

(c) List types of errors and error correction techniques in data communication.

(d) List any four sources of Light used in fiber optics.

(e) Name function(s) of data-link layer and Network layer.

(f) State Wi-Fi and Wi-Max.

(g) List parameters used for specifying wireless technology (any four).

2. Attempt any THREE of the following : **4 × 3 = 12**

(a) Compare Amplitude Modulation and Frequency Modulation with respect to following parameters :

(i) Definition (ii) Power

(iii) Modulation Index (iv) Waveform

(b) Explain working principle of Frequency Shift Keying (FSK) with necessary diagram. Also list any two advantages and two disadvantages.

(c) Suggest types of cables with their specification for the following applications :

(i) Networking for Computer Laboratory

(ii) Computer Networking for administrative building

(iii) Computer / Internetworking for university department

(iv) Cabling for server room of Data Center.

(d) Give functions and specifications of networking devices for cyber café of 5 computers (Any two of the following).

(i) Switches (ii) Router

(iii) Modem (iv) Hub

3. Attempt any THREE of the following : 4 × 3 = 12

(a) Differentiate following types of communication system :

(i) Simplex

(ii) Half-Duplex

(iii) Full-Duplex

with respect to following criteria (any two) :

- Direction of Communication
- Diagram
- Performance
- Application

(b) Describe working principles of Pulse Code Modulation (PCM) with diagram and respective waveforms.

(c) Explain with diagram and working principle and suggest the use of following light sources and in industrial / commercial applications :

(i) LED

(ii) LASER Diode

(d) Compare RS 232 with RS 485 with respect to following characteristics (Any 8) :

(i) Cabling

(ii) Number of devices

(iii) Mode of Operation

(iv) Maximum cable length

(v) Maximum Data rate

(vi) Signaling

(vii) Typical logic levels

(viii) Minimum receiver input impedance

(ix) Receiver sensitivity

4. Attempt any THREE of the following : 4 × 3 = 12

(a) Compare wired communication with fiber optic communication with respect to transmission media, magnetic field bandwidth, attenuation, installation process (any four points).

(b) List any two types of errors and two error correction techniques in data communication.

(c) Give characteristics of reflection and refraction in fiber optics.

(d) Explain following types of communication media using proper diagram for any one example of each :

(i) Guided media

(ii) Unguided media

(e) Suggest specifications for the computer center of Industrial Electronics Department having 15 computers interconnected with internet facility in detail.

Note : Assume suitable data as per situation considered in design approach using following parameters :

- Computer Configuration
- Selection of networking devices
- Media for communication (Guided or Unguided)
- Brief layout of Network topology used for it.

5. Attempt any TWO of the following : **6 × 2 = 12**

(a) Define guided and unguided media. Explain Infrared Communication.

(b) State two applications of following communication techniques :

- Amplitude Modulation (AM)
- Frequency Modulation (FM)
- Pulse Modulation (PM)

(c) Explain following protocols in detail (with necessary diagram if applicable)

(i) FTP

(ii) SMTP

6. Attempt any TWO of the following : **6 × 2 = 12**

(a) Draw the ASK, FSK and PSK waveforms for the given data, give proper labelling.

"01101001"

(b) Describe classifications of optical fiber based on

- Mode
- Index
- Losses

(c) State any four applications where USB architecture can be used. Draw labelled architecture of Universal Serial Bus (USB).
