

# 17438

21415

3 Hours / 100 Marks

Seat No.

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- Instructions :** (1) All Questions are *compulsory*.  
(2) Figures to the right indicate full marks.  
(3) Assume suitable data, if necessary.  
(4) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

**Marks**

1. (A) Attempt any SIX of the following :

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- (a) State the need of modulation.
- (b) List the frequency bands used in satellite communication.
- (c) State the network devices used for
  - (i) connecting two similar networks
  - (ii) connecting two dissimilar networks
- (d) State the types of distortions observed in a Delta Modulation System.
- (e) State two basic types of multiplexing.
- (f) Define cell splitting.
- (g) Give the classification of different types of encoding techniques.
- (h) State types of multiple access techniques.

(B) Attempt any TWO of the following :

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- (a) Define PCM. Write its applications.
- (b) Define hand off. List different types of hand off.
- (c) Draw the architecture of OSI and TCP/IP model. Why TCP/IP is performed in network systems ?

**P.T.O.**

**2. Attempt any FOUR of the following :****16**

- (a) Define frequency modulation. State ideal and practical bandwidth requirement of FM.
- (b) State advantages of pulse modulation over amplitude modulation.
- (c) With neat diagram, describe the principle of FDM.
- (d) Draw ASK signal and FSK signal for the following data, 101010001101.
- (e) Find percentage modulation when  $E_{\max} = 132 V_{pp}$  and  $E_{\min} = 28 V_{pp}$ . Draw AM waveform.
- (f) Compare PPM and PWM with respect to
  - (i) Bandwidth
  - (ii) Transmitted power
  - (iii) Variable parameter of carrier
  - (iv) Output waveform

**3. Attempt any FOUR of the following :****16**

- (a) With neat circuit diagram, explain generation of PWM.
- (b) Compare AM and FM on the basis of sidebands, bandwidth, noise immunity and transmission frequencies used.
- (c) Write step by step procedure for cellular call processing from cellular (mobile) to wire line (PSTN).
- (d) What is bandwidth requirement for FM in which the modulation index is 5 and maximum deviation is 15 KHz ? (Assume highest needed sideband = 6)
- (e) Draw neat block diagram of delta modulator and describe its working.
- (f) State the basic concept of following :
  - (i) Teledermatology
  - (ii) Telesurgery

**4. Attempt any FOUR of the following :****16**

- (a) Describe the concept of frequency reuse.
- (b) Draw neat block diagram of Mobile Communication System and describe each block.
- (c) State the meaning of the terms :
  - (i) hub
  - (ii) repeater
  - (iii) router
  - (iv) gateway
- (d) List network connecting devices, explain any one connecting device.
- (e) Draw the block diagram of single channel biotelemetry system for ECG and describe briefly its operation.
- (f) Draw block diagram of following :
  - (i) Teleradiology
  - (ii) Telecardiology

**5. Attempt any FOUR of the following :****16**

- (a) State different modes of data transmission. Differentiate between synchronous and asynchronous transmission.
- (b) Compare LAN, WAN and MAN with respect to following points :
  - (i) extend of geographical area
  - (ii) basic structure diagram
  - (iii) speed
  - (iv) application
- (c) Draw neat diagrams of following topologies :  
Bus, star, ring, mesh
- (d) What is uplink and downlink in satellite communication ? Why uplink frequency is greater than the downlink frequency ?
- (e) Which mode of transmission is preferred for long distance data transmission and why ?
- (f) State advantages and disadvantages of telemedicine.

**6. Attempt any FOUR of the following :****16**

- (a) Draw the waveform for bit stream 10011011 for
    - (i) Unipolar NRZ
    - (ii) Polar RZ
    - (iii) Bipolar AMI
    - (iv) Manchester code
  - (b) Draw the block diagram of PCM transmitter. State the role of sample and hold circuit.
  - (c) State bandwidth requirement for FSK, BPSK, QPSK and DPSK.
  - (d) Define elevation and azimuth angle of satellite with neat diagram.
  - (e) Compare TDMA and FDMA for four points.
  - (f) Draw basic block diagram of a transponder and explain the function of each block.
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