



# 17438

11819

**3 Hours / 100 Marks**

Seat No.

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- 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) *Figures to the **right** indicate **full** marks.*
  - (5) *Assume suitable data, if **necessary**.*
  - (6) *Use of Non-programmable Electronic Pocket Calculator is **permissible**.*

**Marks**

1. A) Attempt **any six** :

**12**

- 1) Define the terms :
  - i) Bandwidth
  - ii) Information capacity.
- 2) List any two frequency bands of communication system and also state their applications.
- 3) List any four network connecting devices.
- 4) List any two advantages of PCM.
- 5) Identify the multiplexing techniques for following signal transmission.
  - 1) Analog signals
  - 2) Digital signals.
- 6) List out any four terminology related to mobile communication.
- 7) List any four data encoding techniques.
- 8) Give any two applications of satellite communication.

B) Attempt **any two** :

**8**

- 1) Draw block diagram for generation of ASK and list its any two applications.
- 2) List out different methods used to increase the spectrum efficiency. Explain any one.
- 3) List out different modes of data transmission. Suggest mode of data transmission for following.
  - 1) Long distance communication.
  - 2) Short distance communication.

**P.T.O.**

**2. Attempt any four :**

- 1) List any four needs of modulation techniques.
- 2) Difference between natural sampling and flattop sampling based on following parameters.
  - 1) circuit used
  - 2) signal power
  - 3) sampling rate
  - 4) waveform.
- 3) For the following datastream 10110100  
Draw
  - 1) unipolar NRZ
  - 2) polar R2.
- 4) Difference between PCM and DM based on
  - 1) number of bits per sample
  - 2) stepsize.
  - 3) noise
  - 4) bandwidth.
- 5) Define the terms :
  - 1) Noise
  - 2) SNR (signal to noise ratio).
- 6) List any four advantages of pulse modulation over AM.

**3. Attempt any four :**

16

- 1) Draw block diagram of generation of PAM. State function of each block.
- 2) Calculate bandwidth required for FM in which maximum deviation is 5 KHz and  $m_f = 3$ .
- 3) State stepwise procedure for mobile to wireline (PSDN) call processing.
- 4) Draw a neat labelled diagram of FSK. State any two advantages of FSK over ASK.
- 5) Define the term modulation index of AM wave. State the meaning of overmodulation with neat waveform.
- 6) Draw a block diagram of biotelemetry system.

**4. Attempt any four :**

16

- 1) Explain the terms with neat diagram
  - 1) co-channel interference
  - 2) adjacent channel interference.



- 2) With neat diagram explain procedure of Handoff.
- 3) Define the terms :
  - 1) message confidentiality
  - 2) message integrity.
- 4) Suggest the network connecting devices for the following
  - 1) to connect two similar networks
  - 2) to connect two dissimilar networks.
- 5) List advantages and disadvantages of telemedicine (two each).
- 6) Draw a block of single channel biotelemetry system for ECG.

**5. Attempt any four :**

**16**

- 1) Draw architecture of TCP/IP model and state function of each block.
- 2) With neat diagram explain any two network categories.
- 3) Draw architecture of OSI model. State the function of any two layers.
- 4) Define following terms with neat diagram
  - 1) Elevation angle
  - 2) Azimuth angle.
- 5) Draw neat diagram for following
  - 1) star
  - 2) mesh
  - 3) bus
  - 4) ring.
- 6) List any four applications of biotelemetry.

**6. Attempt any four :**

**16**

- 1) Compare FDM and TDM (any four points).
  - 2) List different types of noise present in data modulation and suggest the method to reduce them.
  - 3) Compare ASK and FSK (any four points).
  - 4) Draw and explain block diagram of satellite communication system.
  - 5) Draw diagram of transponder and explain it.
  - 6) List different multiple access techniques. State advantages and disadvantages of CDMA (each two).
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