

17519

21819

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

Marks

1. (A) Attempt any **THREE** of the following : **3 × 4 = 12**
- (a) Draw the block diagram of electronic communication system. State the function of each block.
 - (b) Draw the block diagram to generate ASK. Draw the related waveforms.
 - (c) Draw a block diagram and explain the principle of WDM.
 - (d) An AM transmitter has a carrier frequency of 100 kHz with an amplitude of 6 V. If is modulated to a depth of 60% with signal of 10 kHz. Determine the frequency of the sidebands and the amplitude of the sidebands.

(B) Attempt any ONE :

1 × 6 = 6

- (a) Draw the block diagram of AM transmitter (low level modulation) and state the function of various blocks.
- (b) Draw the block diagram of QPSK generation and describe the working principle.

2. Attempt any FOUR of the following :

4 × 4 = 16

- (a) Define sampling theorem. Compare natural sampling and flat top sampling with waveforms.
- (b) Compare AM and FM for following points :
 - (i) Modulation index
 - (ii) Bandwidth
 - (iii) Nature of waveform in time domain
 - (iv) Applications
- (c) Draw the block diagram to generate FSK signal and explain.
- (d) Define :
 - (i) bit rate
 - (ii) band rate
 - (iii) data rate
 - (iv) channel capacity
- (e) Draw the block diagram of a satellite communication system and state the function of various blocks.
- (f) Explain the concept of frequency reuse in mobile communication.

3. Attempt any FOUR :**4 × 4 = 16**

- (a) Draw the waveforms of modulating signal, carrier signal and PAM waveform on same time scale. State two applications of PAM.
- (b) Draw the block diagram of Delta modulation. Describe its working.
- (c) Draw the block diagram of digital communication system and explain its working.
- (d) Encode the data stream 101100101 with the following encoding techniques :
 - (i) RZ bipolar
 - (ii) AMI
- (e) Draw the block diagram of a telephone system and explain.

4. (A) Attempt any THREE :**3 × 4 = 12**

- (a) State four advantages of digital communication over analog communication.
- (b) Explain B8ZS and HDB3 encoding techniques.
- (c) Explain baseband transmission and passband transmission.
- (d) Explain Handoff procedure and state its types.

(B) Attempt any ONE :**1 × 6 = 6**

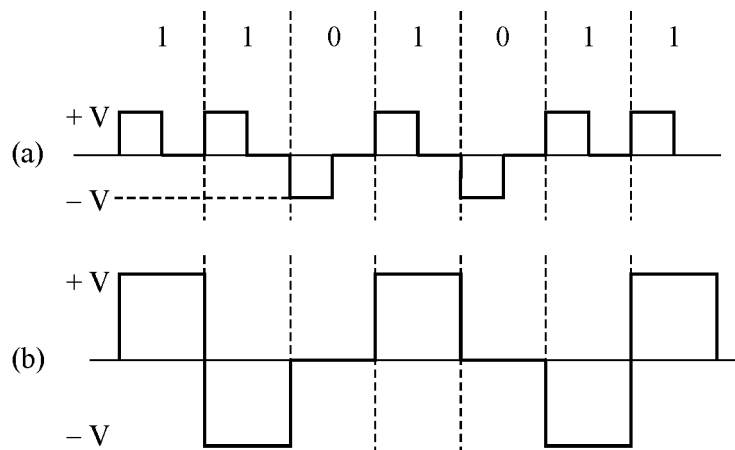
- (a) Draw the block diagram of PCM transmitter and state the function of various block.
- (b) Draw the block diagram of mobile communication system and explain the working.

P.T.O.

5. Attempt any FOUR :

4 × 4 = 16

- (a) Compare PWM & PPM (4 points).
- (b) Explain groundwave propagation with neat diagram. State two features.
- (c) Compare FM & FSK.
- (d) For the data stream 1101101011 represent it as
- (i) ASK (ii) FSK
- (iii) PSK (iv) QPSK
- (e) Observe the figures a and b and identify the encoding technique.



- (f) Describe TDMA.

6. Attempt any FOUR :

4 × 4 = 16

- (a) State two applications each of PCM & PPM.
- (b) Draw the labelled frequency spectrum of AM & FM.
- (c) What are the limitations of DM and explain them.
- (d) Give four application of satellite communication.
- (e) State the sequential steps for handset to handset call procedure.