17519

16117

3 Hours / 100 Marks   Seat No. ⬜⬜⬜⬜⬜⬜⬜⬜

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

(2) *Illustrate your answers with neat sketches **wherever** necessary.*

(3) *Figures to the **right** indicate **full** marks.*

(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. a) Attempt **any three** of the following :   **(3×4=12)**

   i) Draw and explain the block diagram of communication system.

   ii) Define Modulation index for AM. Draw waveforms for m = 1, m > 1, m < 1.

   iii) Compare between FSK and PSK (any four points).

   iv) Explain the concept of frequency use in mobile communication.

  b) Attempt **any one** of the following :   **(1×6=6)**

   i) Compare AM and FM on the basis of definition, waveform, noise immunity, bandwidth, modulation index and frequencies used for transmission.

   ii) Explain the working principle of QPSK with block diagram.

2. Attempt **any four** of the following :   **(4×4=16)**

  a) Describe ionosphere wave propagation with the help of neat sketch.

  b) Define and draw waveforms for PWM and PPM.

  c) Draw block diagram for DPSK generation. State the function of each block.

  d) With neat waveform sketch, encode the data 10110100 using

   i) Bipolar RZ

   ii) Unipolar NRZ technique.

  e) Compare between TDM and FDM (4 points).

  f) Explain the concept of Hand-off.

P.T.O.

Marks

3. Attempt **any four** of the following : (4×4=16)

   a) Compare between DM and ADM (4 points).

   b) Calculate Bits per second of PCM system in which sampling frequency is 8 KHz and each sample is converted into 8 bits with A.D.C.

   c) State the bandwidth requirement of

      i) ASK   ii) FSK   iii) DPSK   iv) QPSK

   d) Draw Polar RZ and split phase Manchester data encoding for 10101100.

   e) Explain the concept of TDM in details.

4. Solve **any four** of the following : (4×4=16)

   a) With neat diagram explain mobile communication system.

   b) Draw FSK waveform for the bit sequence 10101110. State the advantages of FSK over ASK. State the disadvantages of FSK.

   c) State the sequential steps for handset to landline call procedure.

   d) Define quantization. Explain with neat diagram. How to reduce quantization noise ?

   e) Explain Block diagram of satellite communication.

   f) Draw multiplexing hierarchy in FDM.

5. Solve **any four** of the following : (4×4=16)

   a) Explain Shannon's theorem related to channel capacity.

   b) State advantages, disadvantages and application of PCM.

   c) State application of satellite communication systems (any 4).

   d) Draw and explain frequency spectrum of AM. State its advantages and disadvantages.

   e) Draw block diagram of Digital Communication System.

   f) Define and explain Baud rate and Bit rate.

6. A) Attempt **any one**. (1×6=6)

   i) Draw the block diagram of super heterodyne AM Radio Receiver. State the function of each block.

   ii) Draw the block diagram of FSK transmitter. State the function of each block.

  B) Attempt **any three**. (3×4=12)

   i) Explain the working principle of Amplitude Shift Keying Modulation (ASK) with suitable waveforms.

   ii) Draw diagram of PAM generation to obtain flat top sampling. Explain the operation with suitable waveforms.

Marks

iii) Identify the types of encoding technique for the following four waveforms.
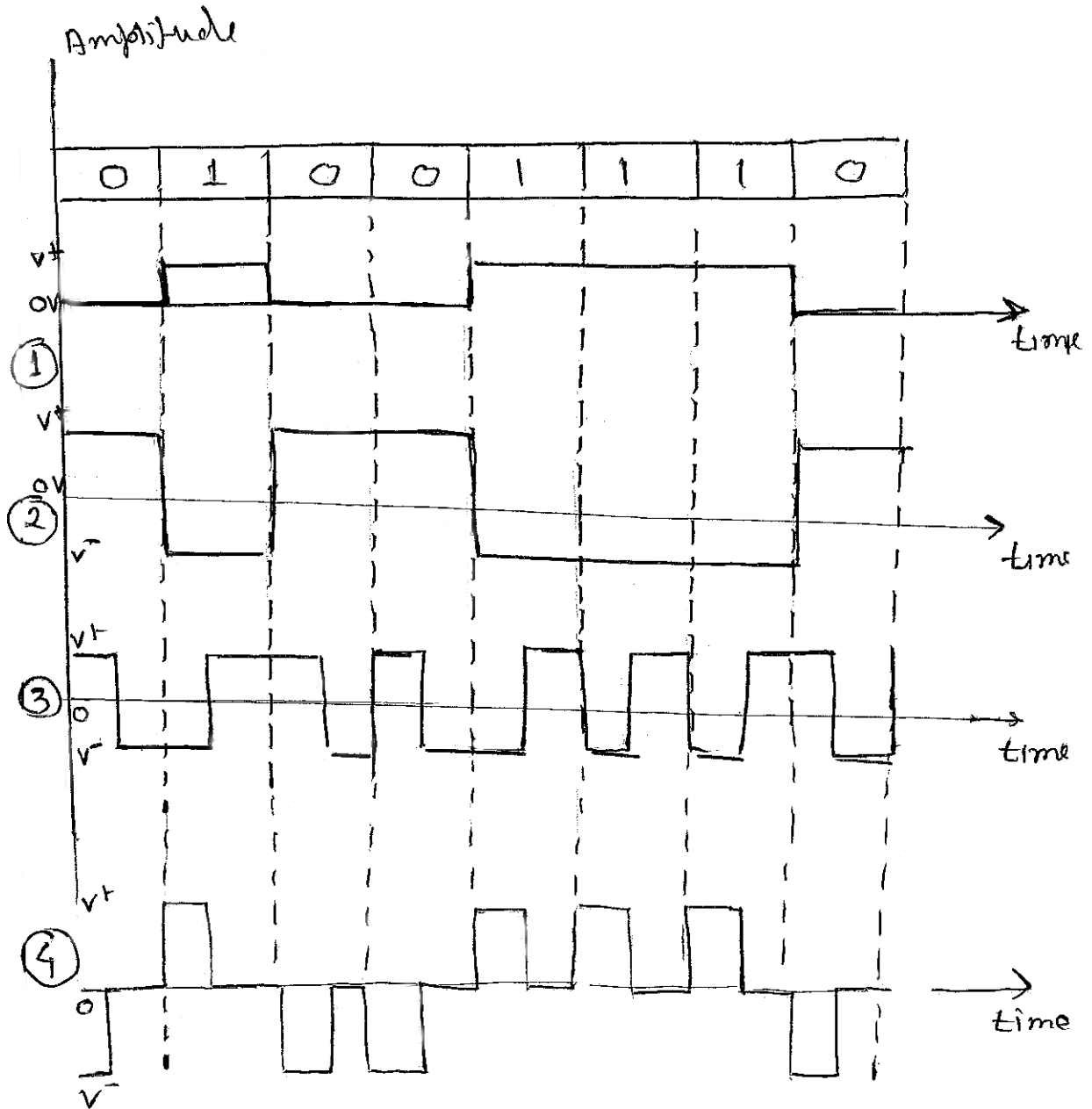
iv) Draw the output waveforms for the following set up.