17519

11718

3 Hours / 100 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) Figures to the ***right*** *indicate* ***full*** *marks.*
(5) Assume suitable data, if ***necessary****.*
(6) Mobile Phone, Pager and any other Electronic Communication devices are ***not*** *permissible in Examination Hall.*

Marks

1. a) Attempt **any three** : **(4×3=12)**

i) State advantages and disadvantages of analog communication.

ii) Explain the basic block diagram of communication system.

iii) Explain the concept of Handoff in mobile communication.

iv) Define : Shanon's theorem for channel capacity and compare analog communication with digital communication.

b) Attempt **any one** : **(6×1=6)**

i) Draw and explain ASK transmitter with block diagram.

ii) Explain superheterodyne AM receiver, state function of each block.

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

a) Draw the labelled AM wave in time domain for

i) modulation index = 1

ii) modulation index > 1

b) State advantages and applications of PAM.

c) Explain FSK transmitter and state function of each block.

d) Define : Bit rate and Baud rate and state importance of encoding.

e) State need of multiplexing. Write types of multiplexing techniques.

f) Describe working of telephone system with block diagram.

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

a) State and explain sampling theorem and Nyquist's rate of sampling.

b) Explain quantization process in PCM and state what is quantization noise.

c) Explain the block diagram of QPSK transmitter.

P.T.O.

Marks

d) Draw signals for data stream 1011001 using following encoding techniques :
   i) Polar RZ
   ii) Bipolar RZ
   iii) Bipolar NRZ
   iv) AMI

e) Compare : TDMA with FDMA (4 pts.)

4. a) Attempt **any three** : **(4×3=12)**
   i) Explain the concept of frequency reuse and cell splitting.
   ii) State advantages and disadvantages of encoding techniques.
   iii) Draw the waveforms of ASK and PSK with relevant examples.
   iv) Draw and explain FM radio receiver.

b) Attempt **any one** : **(6×1=6)**
   i) Discuss the problems associated with Delta modulation in detail and explain working principle of ADM.
   ii) State the need of multiplexing and explain synchronous TDM with relevant sketch.

5. Attempt **any four** : **(4×4=16)**

a) With the help of neat sketch explain ground wave propagation.

b) List advantages, disadvantages and applications of PCM.

c) Compare : Baseband transmission with passband transmission.

d) Draw QPSK signal for data : 10011001. State advantages of QPSK.

e) Encode the data stream 11011010 using following encoding techniques :
   i) Unipolar NRZ
   ii) Manchester code.

f) Draw and explain simple block diagram of satellite comm^{n}.

6. Attempt **any four** : **(4×4=16)**

a) Define uplink and downlink with respect to satellite communication system.

b) Explain working principle of CDMA and list its applications.

c) Describe generation of PPM from PWM with diagram.

d) Explain natural sampling and flat top sampling with relevant waveforms.

e) An AM transmitter produces 10 KW power with the modulation percentage of 75. Calculate carrier power and power in side bands.
