17472

21314

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) 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 <u>SIX</u> of the following:** **12**

i) State the sampling theorem.

ii) Give the frequency bands used in satellite communication.

iii) Compare FM and PM for

1) waveform

2) modulation index.

iv) Define multiplexing. Give its classification.

v) Write features of star topology.

vi) What is dispersion? In which type of fiber it occurs?

vii) State any two advantages and disadvantages of FDM.

viii) Define signal to noise ratio and noise factor.

Marks

b) **Attempt any <u>TWO</u> of the following:** **8**

i) Define ASK and FSK. Draw their waveforms.

ii) Describe working principle of TDM. State its two applications.

iii) Write the mathematical expression for a FM wave and define modulation index of it.

2. Attempt any <u>FOUR</u> of the following: **16**

a) Describe the generation of PAM with the help of block diagram.

b) Describe working amplitude demodulation by diode detector circuit.

c) Encode the binary data stream 1100010 into Unipolar RZ, Polar NRZ, AMI and Manchester code.

d) Describe the working principle of transponder with block diagram.

e) Describe the concept of frequency reuse in mobile communication.

f) Compare AM and FM on the basis of following parameters:

i) waveforms

ii) noise immunity

iii) bandwidth

iv) modulation index.

Marks

3. Attempt any <u>FOUR</u> of the following: **16**

a) Illustrate how PPM is obtained from PWM?

b) Describe quantization and quantization error in PCM.

c) State any four specifications of LASER.

d) Draw uplink model for satellite communication and describe its working.

e) Draw general block diagram of mobile phone system and explain its operation.

f) Define the following terms:

i) Hand off

ii) Cell splitting.

4. Attempt any <u>FOUR</u> of the following: **16**

a) A carrier wave is represented by the equation $e_c(t) = 10 \text{ Sin wt}$. Draw the waveform of a AM wave for m = 0.5.

b) Describe the working principle of Delta modulation. State its disadvantages.

c) Define following terms related to satellite communication:

i) azimuth angle

ii) station keeping.

d) State any four advantages of optical fiber cable.

e) Draw architecture of OSI model.

f) State the sequential steps for wireline (PSTN) to mobile (cellular) call procedure.

Marks

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

a) Describe working of BPSK generation with block diagram.

b) Compare ASK, FSK and PSK on the basis of:

i) variable parameter

ii) bandwidth

iii) noise immunity

iv) error probability.

c) Describe the downlink model used by satellite communication with block diagram.

d) State the functions of following devices:

i) hub

ii) repeater

iii) gateway

iv) router.

e) Describe the concept of digital signature. State the basic difference between message authentication and entity authentication.

f) Describe synchronous and asynchronous data transmission.

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

a) With the help of block diagram explain DPSK modulator.

b) Describe the operating principle of PIN photodiode.

c) Differentiate between multimode step index and multimode graded index fiber.

d) Write electrical characteristics of RS-232 (9-Pin) standard.

e) Describe parallel mode of data transmission.

f) Compare FDMA, TDMA and CDMA (any four points).

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