17472

15116

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 SIX of the following:** **12**

(i) State the sampling theorem.

(ii) Define geostationary satellite. State its two advantages.

(iii) Draw the circuit of AM demodulator. Draw its input and output waveforms.

(iv) Draw the block diagram of FDM generation.

(v) Draw sketches of ring and mesh network topology.

(vi) State and explain Snell's law with neat diagram.

(vii) Define TDM and WDM.

(viii) Give the classification of communication system.

Marks

b) **Attempt any TWO of the following:** **8**

(i) Define FSK and PSK with waveforms.

(ii) Describe TDM generation with suitable block diagram.

(iii) Draw block diagram of electronic communication system. Explain the function of each block.

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

a) Give four advantages of pulse modulation over Analog Modulation.

b) Define modulation. State the need of modulation. (Any 3 points)

c) Encode the binary data stream 10110100 into Return to Zero. (RZ), Non-return to Zero (NRZ), AMI and Manchester code.

d) Compare LEO, MEO and GEO satellites based on following parameters.

(i) Orbit height

(ii) Time for one revolution

(iii) Coverage Area

(iv) Applications

e) Draw block diagram of cellular communication system. State frequencies used for transmitter and receiver.

f) Define modulation index of AM. Calculate modulation index of AM signal with $V_{max} = 4\,V$ and $V_{min} = 2\,V$.

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

a) Draw the circuit diagram of PWM generator and explain its working with waveform.

b) Draw the block diagram of QPSK generator. State functions of each block.

c) Draw block diagram of optical communication system and explain function of each block.

d) Draw the block diagram of satellite communication system. State any four applications of satellite.

Marks

e) Explain co channel and adjacent channel interference in mobile communication system.

f) Define hand - off in mobile communication. Describe hand - off procedure with neat diagram.

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

a) Compare AM and FM w.r.t.

(i) Bandwidth

(ii) Modulation index

(iii) Waveform

(iv) Type of wave

propagation for signal transmission.

b) Draw the block diagram of delta modulation. Explain working of each block.

c) State any four frequency bands used in satellite communication alongwith its uplink and downlink frequencies.

d) State any four advantages of optical fibre communication over other communication system.

e) Compare between LAN, MAN and WAN (any four points)

f) Describe call routing procedure of landline to mobile phone with neat diagram.

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

a) Draw block diagram of PCM generation and state function of each block.

b) Draw the block diagram of ADM transmitter. Explain how slope overload error is reduced in ADM.

c) Draw the block diagram of an earth station.

d) Draw block diagram of modern and explain its working.

e) Give operation of hubs and routers in networking.

f) Draw pin configuration of RS - 232 standards. (9 - pin connector). Explain the function of TXD and RXD.

Marks

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

a) Compare ASK, FSK, PSK w.r.t.

(i) Waveform

(ii) Variable characteristic

(iii) Bit rate

(iv) Noise immunity

b) Describe light propagation in optical fiber with neat diagram. Define acceptance angle and numerical aperture.

c) State different modes of propagation in an optical fiber. Describe them with neat diagram.

d) Explain synchronous and asynchronous mode of data transmission.

e) List the layers of OSI model and state function of any three layers.

f) Draw block diagram of transponder in satellite and explain its working.