17472

21415

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) 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 SIX : **12**

(a) State any four advantages of pulse modulation over continuous wave modulation.

(b) Define : (i) footprint (ii) station keeping.

(c) A 400 watts carrier is modulated to the depth of 75%. Calculate the total power in the modulated wave.

(d) What is line or data encoding technique ? State its characteristics.

(e) Draw the sketch of Star and Bus topology. State its advantages and disadvantages.

(f) Define : (i) Total internal reflection (ii) Numerical Aperture.

(g) What is multiplexing ? State its significance in telecommunication.

(h) State Sampling theorem and Nyquiste rate.

[B] Attempt any TWO : **08**

(a) Draw the generation block diagram of BPSK. State its working with waveform.

(b) Draw the waveform for binary data 1001101 using following encoding techniques :

(i) Polar NRZ-L

(ii) Differential Manchester

(iii) Bipolar RZ

(iv) Pseudoternary

(c) Draw the circuit diagram of diode detector. State its working with waveforms.

2. Attempt any FOUR : **16**

(a) Draw the generation block diagram of PWM and write its working principle.

(b) Draw the circuit of FM using varactor diode and write its working principle.

(c) Draw the block diagram of FDM system. State its advantages & disadvantages.

(d) State advantages and disadvantages of Geostationary satellite.

(e) Explain the concept of frequency reuse with neat diagram. State its merit.

(f) When the modulating frequency in an FM system is 400 Hz and the modulating voltage is 2.4 V, the modulation index is 60. Calculate the maximum deviation. What is the modulation index when the modulating frequency is reduced to 250 Hz and the modulating voltage is simultaneously raised to 3.2 V ?

3. Attempt any FOUR : **16**

(a) Draw the waveforms of PAM, PPM signal.

(b) Draw the block diagram of PCM transmitter and explain its working principle with waveforms.

(c) Compare LED and LASER w.r.t. :

(i) Spectral width

(ii) Information capacity

(iii) Temperature dependence

(iv) Output power

(d) Explain the working principle of TDMA with diagram.

(e) State step by step call procedure from wireline (PSTN) to mobile call.

(f) Define the term handoff with its types. Give the steps involved in hand off process.

4. Attempt any FOUR : **16**

(a) Define modulation index of AM. Calculate modulation index of AM signal with E_{max} = 20 mV and E_{min} = 10 mV.

(b) Draw the block diagram of Adaptive Delta modulation transmitter and write its working principle.

(c) What is uplink and downlink frequency ? State the uplink and downlink range used in C and Ka band.

(d) State eight advantages of optical fiber over metallic cable.

(e) Draw the well labeled layer diagram of OSI model. State function of any three layer.

(f) Define co-channel and adjacent channel interference. How it can be avoided ?

5. Attempt any FOUR : **16**

(a) Draw the generation block diagram of QPSK. State two advantages and two disadvantages.

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

(i) Definition

(ii) Bandwidth requirement

(iii) Noise Immunity

(iv) Waveforms

(c) Draw the block diagram of transponder. State the function of each block.

(d) State the functions of (i) Hub (ii) Repeaters (iii) Gateway (iv) Routers

(e) Draw the block diagram of external modem and write the function of each block.

(f) Write working principle of synchronous and Asynchronous data transmission with schematic diagram.

6. Attempt any FOUR : **16**

(a) Explain the working of delta modulation with the help of block diagram.

(b) Draw the constructional diagram of Avalanche photodiode. Write its working principle.

(c) Draw the diagram of SMSI and MMGI fibers and compare them.

(d) Draw the Architecture of TCP/IP model. State function of each layer.

(e) Explain with example the concept of MAN.

(f) Differentiate between FDMA, TDMA and CDMA on the basis of following parameters :

(i) Multiplexing

(ii) Power Efficiency

(iii) Synchronization

(iv) Guard Band

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