

Seat No. : _____

XC-125

T.Y.B.Sc

March-2013

Electronics

Paper-IX

Time : 3 Hours]

[Max. Marks : 70

1. (a) Define amplitude modulation. Derive the equation of amplitude modulated wave for sinusoidal modulating voltage. Draw necessary waveforms and derive the equation for power output of AM Wave. 7

OR

- (a) What is frequency modulation ? Obtain an expression for the frequency modulated wave, when the modulating wave is a sine wave, drawing the necessary waveforms. Also, obtain expressions for the frequency spectrum and power output of FM Wave. 7
- (b) Explain the trapezoidal method for calculating the modulation index of the AM wave. 5

OR

- (b) Explain the response of AM, FM and Phase modulation for step waveform. 5
- (c) Answer in short : (any **two**) 2
- (i) What is Phase modulation ?
- (ii) What is the minimum possible value of modulation index in AM ?
- (iii) In which type of modulation the modulated power remains equal to carrier power, AM or FM ?

2. (a) Explain the working of diode envelop detector. Hence explain the working of diagonal peak clipping. 8

OR

- (a) Explain the function of automatic gain control in receiver. 8
- (b) Explain the advantage of FM over AM. 4

OR

- (b) Explain the selection of intermediate and oscillator frequencies in super heterodyne receiver. 4
- (c) Answer in short : (any **two**) 2
- (i) What is detection ?
- (ii) What is the image rejection ability of receiver ?
- (iii) What is the basic function of radio receiver ?

3. (a) What is the scanning raster ? Explain the progressive and interlaced scanning. **8**
- OR**
- (a) Explain the current and voltage distribution on a half-wave dipole antenna. **8**
- (b) Explain the mechanism for image peak-up in television. **4**
- OR**
- (b) Explain antenna pattern, radiation resistance and beam width of antenna. **4**
- (c) Answer any **two** : **2**
- (i) The transmission and reproduction of motion pictures for immediate observation is known as _____
- (ii) What is the function of blanking pulse in composite video signal ?
- (iii) What is bandwidth of antenna ?
4. (a) Draw the frequency plan of INSAT. **4**
- OR**
- (a) Explain the Absorption losses in optical fiber. **4**
- (b) Draw the block diagram of typical earth station, and explain the working of antenna subsystem, low noise amplifier and high power amplifier in satellite communication earth stations. **8**
- OR**
- (b) Explain the propagation of light within a fiber and derive an expression for the numerical aperture of the fiber. **8**
- (c) Answer any **two** : **2**
- (i) On what factor does the wave Rayleigh Scattering losses depend in optical fiber ?
- (ii) Which mode of propagation has the shortest delay in the optical fiber ?
- (iii) In satellite communication the full form of SCPC is _____
5. (a) Explain in brief pulse amplitude modulation. **4**
- OR**
- (a) Explain the term FSK bandwidth. **4**
- (b) Discuss the pulse code modulation and its advantages. **8**
- OR**
- (b) Explain the different classes of noise in the amplifier. **8**
- (c) Answer any **two** : **2**
- (i) Mention any one advantage of digital modulation.
- (ii) What is sampling theorem ?
- (iii) What is the signal to noise ratio ?