Scheme G

Sample Test Paper – I

Course Name : Electronics Engineering Group

Course Code : EJ/ET/EX/EN/ED/EI **17440**

Semester : Fourth

Subject Title : Analog Communication

Marks : 25 **Time: 1 hour**

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q1. Attempt any THREE from the following. **09 Marks**

a. Draw the basic elements of communication system. Write function of communication channel in it.

b. Differentiate between simplex and duplex communication using diagram, give two examples of each.

c. Define: 1. Modulation, 2. Modulation index of AM and 3. Deviation ratio of FM

d. State the necessity of RF amplifier in a radio receiver (any three points).

Q2. Attempt any TWO from the following. **08 Marks**

a. Define electrical noise. Describe the term thermal noise and its relationship to temperature and bandwidth.

b. For an AM, DSBFC modulator with a carrier frequency fc=100KHz and a maximum modulating signal frequency fm=5KHz, determine:

   a. Frequency limits for upper and lower side band
   b. Bandwidth
   c. Draw the output frequency spectrum

c. State two advantages and two disadvantages of FM over AM.

Q3. Attempt any TWO from the following. **08 Marks**

a. Explain with proper waveforms the generation of PWM using IC555.

b. Draw block diagram of low and high level AM modulator. State the difference between them.

c. Find the carrier and modulating frequencies, the modulation index, and the maximum deviation of FM wave represented by the voltage equation $v=10\sin(5.5\times10^{8}t + 4\sin 1250t)$. What power will this FM wave dissipate in a 15Ω resistor?

Scheme G

Sample Test Paper-II

Course Name : Electronics Engineering Group

Course Code : EJ/ET/EX/EN/ED/EI

Semester : Fourth

17440

Subject Title : Analog Communication

Marks : 25 **Time: 1 hour**

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q1. Attempt any THREE from the following. **09 Marks**

a. Draw balanced slope detector circuit and its transfer function curve.

b. Define: 1) Critical frequency 2) Maximum usable frequency 3) Skip distance.

c. Draw equivalent circuit of a transmission line. State various types of metallic transmission lines

d. State two disadvantages of ground waves and its two applications.

Q2. Attempt any TWO from the following. **08 Marks**

a. Draw the block diagram of FM radio receiver and explain function of limiter in it.

b. List various types of losses in transmission line and explain any one loss in detail.

c. Determine the height of receiving antenna to obtain a maximum transmission distance of 48.7Km from a transmitting antenna of 40m height.

Q3. Attempt any TWO from the following. **08 Marks**

a. Draw the block diagram of Phase Lock Loop as FM detector and state the function of Voltage control oscillator.

b. Define:

a. Reflection coefficient
b. Standing wave ratio

and establish relationship between them.

c. Describe the various properties of the layers of ionosphere.

Scheme G

Sample Question Paper

Course Name : Electronics Engineering Group

Course Code : EJ/ET/EX/EN/ED/EI

Semester : Fourth

17440

Subject Title : Analog Communication

Marks : 100 **Time-: 3 hour**

Instructions:

1. All questions are compulsory
2. Illustrate your answers with neat sketches wherever necessary
3. Figures to the right indicate full marks
4. Assume suitable data if necessary
5. Preferably, write the answers in sequential order

Q1. A) Attempt any SIX from the following. **12 Marks**

a. Define base band signal. Why it is not transmitted directly.

b. Define modulation index for AM and write its minimum and maximum value.

c. Define pulse modulation and state its types.

d. What is the purpose of a limiter in FM receiver?

e. Why FM reception is noise free?

f. Define stub. State its two advantages.

g. Why electromagnetic waves are said to be transverse waves?

h. Define polarization and Beam width.

Q1. B) Attempt any TWO from the following. **08 Marks**

a. Define noise and list different external noise. Explain atmospheric noise.

b. Draw the constructional details of Yagi antenna and draw its radiation pattern.

c. Compare ground wave and space wave propagation on basis of frequency range and method of wave propagation..

Q2. Attempt any FOUR from the following. **16 Marks**

a. What is folded dipole antenna? Draw its radiation pattern list its advantages.

b. Draw and explain PWM circuit using IC 555.

c. Differentiate between simplex and duplex mode of communication with neat sketch.

d. Describe superhetrodyning principle with help of block diagram.

e. Draw and explain equivalent circuit of a transmission line. Also draw the circuit for audio frequency and radio frequency.

f. Write a mathematical expression for amplitude modulated wave & explain its meaning.

Q3. Attempt any FOUR from the following. 16 Marks

a. For AM F_c = 100KHz, F_m = 5KHz determine:
    a. Upper and lower side band frequencies
    b. Bandwidth

b. Define Image frequency. The RF, Local oscillator frequency, IF frequencies for AM receiver are 800KHz, 1255KHz and 455KHz respectively, determine Image frequency.

c. Explain Ionospere layers and Inospheric propogation.

d. How different types of losses affect the use of transmission line in different applications.

e. A practical antenna has directive gain of 5dB radiate 1200 watt power. How much power an isotropic antenna should radiate in order to have the same power density at the same distance?

f. Draw and explain transistor reactance modulator for FM generation.

Q4. Attempt any FOUR from the following. 16 Marks

a. What are the sources of distortion in Armstrong method & how to reduce it.

b. Compare the bandwidth that would be required to transmit baseband signal with a frequency range from 300 Hz to 3 KHz using:
    a. Narrow band FM with maximum deviation of 5KHz
    b. Wideband FM with maximum deviation of 75KHz.

c. For a transmission line, the incident voltage Ei = 6v and Er = 3v. Calculate:
    a. Reflection coefficient
    b. Standing Wave Ratio.

d. Explain the following

a. Critical frequency
b. Maximum usable frequency
c. Virtual height
d. Skip distance

e. Write one application of the following antenna:
    a. Rectangular antenna
    b. Dish antenna
    c. Yagi-Uda antenna
    d. Horn antenna
f. Give the need for stub and explain single stub matching. List the advantages and disadvantages of single stub matching.

Q5. Attempt any FOUR from the following. 16 Marks

a. Draw and explain preemphasis curve.
b. Draw block diagram of FM receiver and write function of any two block.
c. Explain the quarter wavelength transformer for impedance matching.
d. The operating frequency for a pyramidal horn antenna is 10GHz. The horn antenna is 10 cm high and 12 cm wide. Calculate:
    a. Beam width of antenna
    b. Power gain of antenna if K = 0.5
e. Draw and explain FM demodulator using Phase Lock Loop.
f. Draw voltage and current standing waves of a transmission line terminated in an open circuit. State four characteristics of this transmission line.

Q6. Attempt any FOUR from the following. 16 Marks

a. Draw a transistorized PAM modulator circuit and describe its operation.
b. Explain sensitivity and fidelity term used in AM receiver.
c. Draw the circuit of FET amplitude limiter used in FM receiver.
d. Draw the diagram of ratio detector and explain its working.
e. Explain error tracking with respect to intermediate frequency.
f. For 2 meter diameter parabolic reflector with 10 watt of power radiated by the feed mechanism operating at 6GHz with transmit antenna efficiency of 55%. Determine:
    a. Beamwidth of antenna
    b. Transmit power gain