Total number of printed pages:4

D/3rd/DECE301

2021

PRINCIPLE OF ELECTRONIC COMMUNICATION

Full Marks: 100

Time: Three hours

The figures in the margin indicate full marks for the questions.

*Answer **any five** questions*

Q.1

1X5=5

a)

i) Vm=1V Vc = 2V calculate modulation index of AM.

ii) Carrier signal is a ..... frequency signal .

iii) For amplitude modulation amplitude of ..... signal is varied in accordance with modulating sinal.

iv) Sin200πt calculate frequency of this signal.

v) Microphone converts voice information into ..... signal.

4+1=5

b)

i) Change the form of Amplitude modulated signal equation to draw frequency spectrum of AM.

ii) Draw frequency spectrum of AM signal.

1+4=5

c)

i) Define amplitude modulation ?

ii) Explain amplitude modulation with drawing of modulation signal, carrier signal and amplitude modulated signal.

d) Draw the block diagram of communication system and explain it's function in brief. 2+3=5

Q.2 1X5=5

a)

i) fm =100hz fc=5khz Calculate USB frequency of AM spectrum.

ii)Maximam frequency deviation of a FM signal = 1khz and modulating frequency is 500hz Calculate modulation index.

iii) For AM m=1 Pc=100watt Calculate LSB power .

iv) For frequency modulation .....of carrier signal remains unchanged.

v) For AM m=1 Ic=10A Calculate total current .

b) 4+2=6

i) Derive the total power relation of amplitude modulated waveform with carrier power and modulation index.

ii) Explain the importance of above power relation.

c) 3+6= 9

i) Draw the circuit diagram of a grid modulated class C amplifier and explain how the same circuit generates amplitude modulated waveform.

Q.3

a) State whether following statements are TRUE/FALSE 1X6=6

i) Bandwith requirement of FM is more than AM.

ii) SSB Transmission needs more power than DSB.

iii) Filter method is used to generate DSB sgnal.

iv) Inside a noisy environment FM works much better than AM.

v) Power of AM transmission depends on depth of modulation.

vi) Banwidth requirement of AM is 4fm.

b) Explain how a Balanced modulator circuit generates DSB signal. 9

c) Draw and describe in brief block diagram of filter method to generate SSB signal. 2+3=5

Q.4

a) 1X4= 4

i)Vmax=2V Vmin=1V Calculate Standing wave ratio.

ii) Impedance matching is possible by using ..... lines.

iii) Characteristics impedance is measured at input of transmission line when its leght is .....

iv) Antenna radiates ..... waves.

b) 2+2=4

i) When we need to consider transmission line effect of interconnecting wires?

ii) Draw general equivalent circuit of transmission line.

c) Write short notes on (any three) 3X4=12

i) Standing waves.

ii) Electromagnetic radiation.

iii) Propagation of waves.

iv) Sky-Wave Propagation.

v) Ground waves.

Q.5

a) Derive mathematical representation of FM signal. 6

b) Compare AM and FM transmission. 5

c) 3+3+3=9

i)A broadcast radio transmitter radiates 30kWwhen the modulation percentage is 70. How much of this is carrier power?

ii) Write short note on bandwith.

iii) Draw modulating signal, carrier signal and Frequency modulated signal.

Q.6

a) Draw the block diagram of phase shift method and describe SSB generation. 3+6=9

b) Draw and Describe Varactor diode modulator for FM generation. 2+5=7

c) Write short note on Evolution of the half wave dipole antenna. 4

Q.7

a) Define the following for a ante nna 2X3=6

i) Antenna Resistance ii) Band width iii) Beamwith

b) What is dipole arrays? Write short note on Broad side array. 2+3=5

c) Draw Yagi antenna, it's radiation pattern, and optical equivalent and explain it's radiation pattern. 2+1+1+5=9