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328452(28)

B. E. (Fourth Semester) Examination, April-May 2020

(New Scheme)

(ET & T Engg.)

ANALOG COMMUNICATION

Time Allowed : Three hours

Maximum Marks : 80

Minimum Pass Marks : 28

Note : *Attempt all questions. All questions carry equal marks. Part (a) of each question is compulsory and carry 2 marks. Attempt any* ***two*** *parts from (b), (c) & (d) and carry 7 marks. Assume suitable data if required.*

Unit-I

1. (a) Define modulation index for AM and write its minimum and maximum value. 2

(b) How AM is generated using square low modulator? Derive relevant expressions. 7

(c) With neat diagrams, explain about the VSB modulation system and also explain its application. 7

(d) Draw the block diagram of superheterodyne radio receiver and explain its operation. What are the advantages of this receiver. 7

Unit-II

2. (a) Define angle modulation. What are the types of angle modulation. 2

(b) Find the carrier, modulating frequency, modulation index and maximum deviation of the FM wave represents by the equation. 7

$$e_{FM}(t) = 12\sin\left(6\times10^{8t} + 5\sin 1250t\right)$$

What power will FM wave dissipate in a 10Ω resistance?

(c) Give comparison between FM and PM.

(d) Draw the block diagram of Armstrong method and explain its operation for FM generation. Why this method is called indirect method?

Unit-III

3. (a) What is noise? What are the various sources of noise? 2

(b) Define noise bandwidth. What is the relation between noise bandwidth and noise power at the output of a system. 7

(c) What is narrowband noise? Discuss the properties of the quadrature components of a narrowband noise. 7

(d) Explain the effect of filtering on the probability density of Gaussian noise. 7

Unit-IV

4. (a) Define figure of merit. 2

(b) Explain AM receiver model. 7

(c) Explain the noise performance of SSB-SC receiver and prove its S/N ratio is unity. 7

(d) Derive an expression for $(SNR)_c$ and $(SNR)_o$ for AM receiver using envelop detection. Hence, obtain figure of merit and comment on the result. 7

Unit-V

5. (a) What is capture effect in FM system. 2

(b) Why pre-emphasis and de-emphasis are used in FM? Draw the circuit diagrams and the characteristics of pre-emphasis and de-emphasis circuits. 7

(c) Derive the output SNR for FM reception. 7

(d) Give the comparison between FM and PM in multiplexing. 7