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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, JULY 2017

Course Code: EC208

Course Name: ANALOG COMMUNICATION ENGINEERING (EC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any 2 questions. Question No.1 is compulsory.

1 a) Starting from the representation of sinusoidally modulated AM wave: - (10)
i) Find the frequency spectrum for sinusoidal AM
ii) Derive the equation for total transmitted power

b) Give reason for the occurrence of double spotting in AM receivers. (5)

2 a) Draw the block diagram and explain the working of a low-level AM transmitter. (10)

b) A transmitter with a 10KW carrier transmits 11.2 KW when modulated with a single sine wave: - (5)
i) Calculate the modulation index.
ii) If the carrier is also simultaneously modulated with another sine wave at 50% modulation, calculate the total transmitted power

OR

3 a) Explain the working of a diode detector for AM demodulation with diagrams. (10)

b) A 12 GHz receiver consists of first stage with gain G1 =30 dB and noise temperature T1 =20 K, a second stage with gain G2 = 10 dB and noise temperature T2 = 360K and third stage with gain G3 = 15 dB and noise temperature T3 = 1000 K. Calculate the effective noise temperature and noise factor of the system. Take the reference temperature as 290 K. (5)

PART B

Answer any 2 questions. Question No.4 is compulsory.

4 a) With block diagram, explain the working of a super heterodyne receiver and list their advantages. (10)

b) Write the advantages of double conversion receiver. (5)

5 a) With neat block diagram, explain the generation of SSB using phasing method. (10)

b) Explain the factors that affect the sensitivity and selectivity of a super heterodyne receiver. (5)

OR

6 a) With block diagram, explain the working of a balanced modulator circuit using FETs, for the generation of double sideband suppressed carrier. (10)

b) Compare the merits and demerits of AM and FM. (5)

PART C

Answer any 2 questions. Question No.7 is compulsory.

7 a) With a block diagram, explain the FM demodulator using PLL. (10)

b) Explain with diagrams, how the response of parallel tuned circuit is made use for the demodulation of FM. (10)

8 a) With block diagram, explain the working of a Foster Seeley discriminator. (10)

b) With supporting equations and block diagram, explain how the FM can be obtained using PM. (10)

OR

9 a) Explain FM modulator circuit using JFET reactance modulator, taking particular case of Z_1 as capacitive reactance and Z_2 as pure resistance. (10)

b) Explain with circuit diagrams and response, the pre-emphasis and de-emphasis in FM. Also write the need for pre-emphasis and de-emphasis in FM. (10)

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