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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   (5)
        single sine wave: -
        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   (5)
        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.

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   (10)
        their advantages.
   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   (5)
        receiver.

OR

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

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   (10)
         using PM.

OR

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

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

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