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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  $G_1 = 30$  dB and noise temperature  $T_1 = 20$  K, a second stage with gain  $G_2 = 10$  dB and noise temperature  $T_2 = 360$  K and third stage with gain  $G_3 = 15$  dB and noise temperature  $T_3 = 1000$  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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