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Reg No.:	Name:

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

FOURTH SEMESTER B.TECH DEGREE EXAMINATION, MAY 2019

Course Code: EC208

Course Name: ANALOG COMMUNICATION ENGINEERING (EC)

Max. Marks: 100 Duration: 3 Hours

PART A

Answer any two full questions, each carries 15 marks. 1 a) Explain different types of noises that are generated in an amplifier. (8) b) Draw the circuit diagram of a diode detector and explain its working. (7) 2 a) Two resistors of values 10kΩ and 20kΩ in an amplifier are kept at 50°C. The bandwidth of the amplifier is 1 MHz. Find the equivalent thermal noise voltages generated by these resistors when they are connected (a) in series and (b) in

- b) Derive the spectrum for sinusoidally modulated AM wave and also derive the (9) expression for the total average power.
- 3 a) Define noise factor and derive the expression for the output noise power of an (6) amplifier in terms of noise factor.
 - b) Draw the block diagram of AM transmitter and explain it. (6)
 - c) The tuned circuit of the oscillator in an AM transmitter employs a 50μH coil and a 10nF capacitor. The output of the oscillator is modulated by speech signal frequencies up to 4 kHz, what is the frequency range occupied by the sidebands

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) With the help of a block diagram, explain the phase shift method of SSB (9) generation. Derive the expression for the output voltage.
 - b) Prove that the average power in an FM wave is equal to its un-modulated carrier (6) power.
- 5 a) What are the drawbacks of a tuned radio frequency (TRF) receiver? With the (10) block diagram of a super-heterodyne receiver, explain that they do not suffer from these drawbacks.
 - b) Calculate the percentage power saving when the carrier and one of the sidebands (5)



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are suppressed in an AM wave with modulation index equal to (a) 1 and (b) 0.25.

- 6 a) With the block diagram of transmitter and receiver, explain pilot carrier SSB (10) system.
 - b) Make a comparison of AM with FM (5)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) With the block diagram, explain Armstrong method for FM generation. (10)
 - b) Draw the circuit diagram of amplitude limiter and explain its working. (10)
- 8 a) With the help of circuit diagram, explain the working of a varactor diode (10) modulator.
 - b) Using expressions, compare FM and PM and show that FM may be generated (5) using PM.
 - c) What are the basic functions of a telephone set? (5)
- 9 a) With the help of a circuit diagram, explain the working of a JFET reactance (10) modulator.
 - b) Explain the working of a cordless telephone. (10)
