

Reg No.: _____

Name: _____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY
FOURTH SEMESTER B.TECH DEGREE EXAMINATION, APRIL 2018

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.

Marks

- 1 a) An amplifier operating over the frequency range from 18 to 20 MHz has a $10\text{ K}\Omega$ input resistor. What is the rms noise voltage at the input to this amplifier if ambient temperature is 27°C . (5)
- b) Define AM. Draw a neat AM waveform its frequency spectrum for sinusoidal AM. Also derive the expression for AM. (10)
- 2 a) Derive the expression for power, voltage and current in AM. (5)
- b) The antenna current of an AM transmitter is 8Amp when only the carrier is sent, but it increases to 8.93 Amp when the carrier is modulated by a single sine wave. Find the percentage modulation. (5)
- c) Write short note on the following: (5)
i) Short noise ii) Burst noise
- 3 a) Draw the block diagram of an AM transmitter. Explain the working of each block. (10)
- b) Write at least four reasons for which modulation is needed in an analog communication system. (5)

PART B

Answer any two full questions, each carries 15 marks.

- 4 a) With help of the block diagram explain SSB reception using phasing method and derive the expression for its final output. (7)
- b) Define image frequency and image rejection ratio. (4)
- c) Compare AM and FM with any 4 main points. (4)
- 5 a) With the help of a block diagram, explain the working of pilot carrier SSB transmitter and receiver. (7)
- b) Define FM. Draw a neat FM waveform and derive the expression for FM. (8)
- 6 a) Draw the block diagram of SSB reception using third method (Weaver's method). Derive the expression of its output and explain the working principle. (7)
- b) Draw the block diagram of a superheterodyne receiver and explain the working of each block. (8)

PART C

Answer any two full questions, each carries 20 marks.

- 7 a) Derive the expression for sinusoidal PM and show the equivalence between FM and PM. (10)
- b) With neat circuit diagram explain the working of a Foster-Seeley discriminator. Also draw the discriminator response (V/f). (10)

- 8 a) Draw the block diagram of FM transmitter using indirect method and explain its working. (10)
- b) Describe the working of a varactor diode modulator in FM. (10)
- 9 a) Describe the working of a Transistor modulator in FM. (10)
- b) Draw and explain pre-emphasis and de-emphasis circuits used in FM. (5)
- c) Explain the working principle of DTMF. (5)
