

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

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|------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1 a) | An amplifier operating over the frequency range from 18 to 20 MHz has a 10 K Ω input resistor. What is the rms noise voltage at the input to this amplifier if ambient temperature is 27 ⁰ 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:
i) Short noise ii) Burst noise | (5) |
| 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.

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| 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.

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| 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)
