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| Reg No.: | Name: | |
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APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

Fourth semester B.Tech examinations (S), September 2020

| Course Code: EC208 | | | | | | |
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| Course Name: ANALOG COMMUNICATION ENGINEERING (EC) Max. Marks: 100 Duration: 3 Hour | | | | | | |
| Wax. Warks. 100 | | | | | | |
| | | PART A Answer any two full questions, each carries 15 marks. | Marks | | | |
| 1 | a) | Define the terms signal to noise ratio, noise temperature and noise figure. | (6) | | | |
| | b) | Draw and explain the working of transistorized, collector modulated AM circuit. | (9) | | | |
| 2 | a) | Write short notes on shot noise and thermal noise. What are the methods to | (9) | | | |
| | , | reduce the thermal noise? | , , | | | |
| | b) | A modulating signal of frequency 5KHz with peak voltage of 6V is used to | (6) | | | |
| | | modulate a carrier frequency of 10MHz with peak voltage of 10V. Determine 1) | | | | |
| | | Modulation index 2) Frequency of LSB and USB 3) Amplitude of LSB and USB | | | | |
| | | 4) Draw the line spectrum. | | | | |
| 3 | a) | Calculate the thermal noise power available from any resistor at room | (6) | | | |
| | | temperature 290k for a bandwidth 2MHz. Also calculate the corresponding noise | | | | |
| | | voltage, given that $R=100\Omega$. | | | | |
| | b) | Explain the power relation between carrier and sidebands in AM for sinusoidal | (9) | | | |
| | | modulation, after deriving the fundamental voltage equation for AM. | | | | |
| | | PART B | | | | |
| | | Answer any two full questions, each carries 15 marks. | | | | |
| 4 | a) | Explain the Third method of SSB generation with relevant diagram and | (8) | | | |
| | | appropriate mathematical expression. | | | | |
| | b) | Prove that the balanced modulator produces an output consisting of sidebands | (7) | | | |
| | | only with the help of a circuit diagram. | | | | |
| 5 | a) | Explain with the help of neat sketch the working of super heterodyne receiver. | (9) | | | |
| | | Also how tracking is carried out. | | | | |
| | b) | An FM wave is represented by the equation $e = 10 \sin(5x10^8 t + 4\sin 1250t)$. Find | (6) | | | |
| | | a) Carrier and modulating frequency b) Modulation index and maximum | | | | |
| | | deviation c) Power dissipated by this FM wave in a 5Ω resistor. | | | | |
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| 6 | a) | With the help of a block diagram, pilot carrier SSB transmitter. Why we use pilot | (8) |
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| | | carrier? | |
| | b) | Explain the need for AGC. Draw typical AGC circuit for a super heterodyne | (7) |
| | | receiver and explain its working. | |
| | | PART C Answer any two full questions, each carries 20 marks. | |
| 7 | a) | With block diagram explain the FM Stereo broadcasting Transmitter. | (10) |
| | b) | Describe with block diagram, operation and basic functions of a standard | (10) |
| | | telephone switch. | |
| 8 | a) | Draw the block diagram of an Armstrong indirect FM Transmitter and describe | (10) |
| | | its operation. | |
| | b) | With supporting equations and block diagram explain how the PM can be | (10) |
| | | obtained by using FM and vice versa. | |
| 9 | a) | Explain how a Foster-Seeley discriminator may be used to detect FM waves, with | (10) |
| | | relevant circuit and phasor diagrams. | |
| | b) | What is AFC? Explain its function. | (4) |
| | c) | Describe the difference between the operation of a codeless telephone and a | (6) |
| | | standard telephone. | |
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