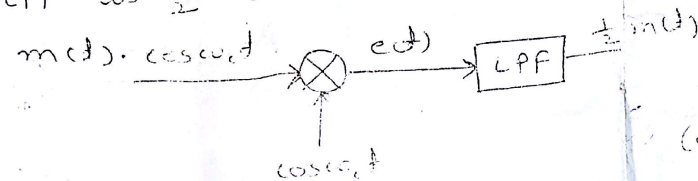


Course Code: ETU502
Course: Analog Communication

Total marks: 15
Duration: 1 Hr

Attempt the following.

- 1) For a base band signal $m(t) = \cos \omega_m t$, find the DSB-SC signal. Sketch the spectrum. Also prove that, for the following fig, output of LPF is $\frac{1}{2} m(t)$



(04 marks)

- 2) The antenna current of an AM transmitter is

- 3) 8 amperes when the carrier is sent, and it increases to 8.9 amperes when the carrier is modulated by a single sine wave. Find the percentage modulation. Determine the antenna current when the percent of modulation changes to 0.8.

(04 marks)

- 3) Explain the need of modulation (04 marks)

- 4) Describe any two methods of AM demodulation (04 marks)

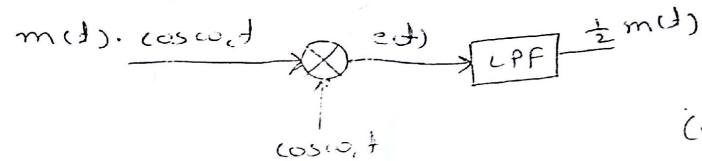
$c = \frac{f}{\lambda}$

Course Code: ETUS02
Course: Analog Communication

Total marks: 15
Duration: 1 Hr

Attempt the following.

- 1) For a base band signal $m(t) = \cos \omega_m t$, find the DSB-SC signal. Sketch the spectrum. Also prove that for the following fig., output of LPF is $\frac{1}{2} m(t)$



(04 marks)

- 2) The antenna current of an AM transmitter is 8 amperes when only the carrier is sent, but it increases to 8.93 amperes when the carrier is modulated by a single sine wave. Find the percentage modulation. Determine the antenna current when the percent of modulation changes to 0.8.

(03 marks)

- 3) Explain the need of modulation. (04 marks)

- 4) Describe any two methods of AM demodulation (04 marks)

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI

(An Autonomous Institute of Government of Maharashtra)

Electronics and Telecommunication Department

Course Code: ETU502

Class Test 1

Max. Marks 15

Course Name: Analog Communication

Time: 1 Hour

Q.1 A modulating signal consists of a symmetrical triangular wave having zero dc component and peak to peak voltage of 11V. It is used to amplitude modulate a carrier of peak voltage 10V. Calculate the modulation index and the ratio of side lengths L_1/L_2 of the corresponding Trapezoidal pattern. (05)

Q.2 What is modulation? Explain the need of modulation. (05)

Q.3 Show that maximum power in amplitude modulation is 1.5 times its carrier power. (05)

OR Explain super heterodyne radio receiver with neat block diagram. (05)

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GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI
(An Autonomous Institute of Government of Maharashtra)

Course Code and Name: ETU502 Analog Communication

Date: 04/08/2017

Class Test-I

Time: 1 Hour

Marks: 15

Solve any Three

- Q.1 Classify the radio frequency spectrum used in communication system using wavelength, and applications.
- Q.2 a) An amplifier operating on a frequency range from 18 to 20 MHz has a $10\text{K}\Omega$ input resistance. Find the rms noise voltage at the input to this amplifier if the ambient temperature is 27°C .
- b) A receiver connected to an antenna whose resistance is 75Ω has an equivalent noise resistance of 40Ω . Calculate the receiver's noise figure in decibels and its equivalent noise temperature.
- Q.3 The output voltage of a transmitter is given by $400(1+0.4 \sin 6280t) \sin 3.14 \times 10^7 t$. This voltage is fed to a load of 600Ω resistance. Determine a) Carrier frequency b) Modulating frequency c) Carrier power d) Total power output e) Peak power output.
- Q.4 A complex modulating waveform consisting of a sine wave of amplitude 3V and frequency 1000Hz plus a cosine wave of amplitude 5V and frequency 3000Hz amplitude modulates a carrier of 500KHz with 10V peak. Plot the spectrum of modulated wave and determine the average power when the modulated wave is fed into a 50Ω load.

GOVERNMENT COLLEGE OF ENGINEERING, AMRAVATI
(An Autonomous Institute of Govt. of Maharashtra)

Electronics Engineering Department

Class test I

Sub: ETU 502 Analog Communication

Marks: 15

26th Aug, 2019

solve any three

1. Examine external and internal noise with examples and expression. An amplifier operating over the frequency range of 455 to 460 kHz has a $200\text{ k}\Omega$ input resistor. What is the rms noise voltage at the input to this amplifier if the ambient temperature is 17°C ?
2. Using time domain representation of the AM wave derive an expression for modulation index and transmitted power. What will be the radiated power at 85 percent modulation for a broadcast AM transmitter radiates 50kW of carrier power?
3. Compare and contrast three different methods for generating single side band with suppressed carrier.
4. Examine VSB modulation technique and derive expression for instantaneous voltage and total power of VSB wave.