

Roll No. ....

Total No. of Questions : 09]

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## Paper ID [EC301]

(Please fill this Paper ID in OMR Sheet)

B.Tech. (Sem. - 5<sup>th</sup>)

### ANALOG COMMUNICATION SYSTEMS (EC - 301)

Time : 03 Hours

Maximum Marks : 60

Instruction to Candidates:

- 1) Section - A is Compulsory.
- 2) Attempt any Four questions from Section - B.
- 3) Attempt any Two questions from Section - C.

#### Section - A

Q1)

(10 x 2 = 20)

- a) Is it possible to suppress both side bands without affecting information in AM?
- b) What are the frequency range of AM and FM broadcast bands?
- c) Why is higher percentage of modulation desirable in AM?
- d) What are the applications of SSB system?
- e) The Q of a tuned circuit is 250 at the resonant frequency of 500 kHz. What is the bandwidth?
- f) What is the cause of diagonal clipping in a diode detector?
- g) Why is local oscillator frequency always higher than the signal frequency?
- h) What is double spotting?
- i) What is the operating principle of slope detector?
- j) Define Nyquist rate.

## Section - B

(4 x 5 = 20)

- Q2) Define frequency modulation. Derive the expression for instantaneous amplitude of FM wave. Define modulation index.
- Q3) When the modulation percentage is 75, an AM transmitter produces 10 kW. How much of this is carrier power? What would be the percentage power saving if the carrier and one of the sidebands were suppressed before transmission took place.
- Q4) Draw the block diagram of Phase Shift method and explain how the carrier and unwanted sideband are suppressed. What change is necessary to suppress the other sideband?
- Q5) Explain with help of circuit diagram how delayed AGC can be realized. What are its merits over simple AGC?
- Q6) Explain the FET amplitude limiter with its transfer characteristics.

## Section - C

(2 x 10 = 20)

- Q7) Explain the working of phase discriminator circuit with the help of block diagram and phasor diagrams. Prove that the phase discriminator is an FM demodulator.
- Q8) (a) What are the limitations of TRF receivers and how are they overcome?  
(b) Explain how the use of RF amplifier improves the signal to noise ration in a superhetrodyne receiver.  
(c) How is neutralization achieved in RF amplifiers?
- Q9) Compare the following:  
(a) AM and FM.  
(b) Coherent and non-coherent detection.  
(c) Additive and multiplicative mixing.

