Total No. of Questions—8]   [Total No. of Printed Pages—3

Seat
No.

[5252]-138

S.E. (E&TC/Elect.) (Second Semester) EXAMINATION, 2017

ANALOG COMMUNICATION

(2012 PATTERN)

Time : Two Hours   **Maximum Marks : 50**

N.B. :— (*i*) Neat diagrams must be drawn wherever necessary.

(*ii*) Figures to the right indicate full marks.

(*iii*) Assume suitable data, if necessary.

(*iv*) Attempt Q. No. **1** *or* Q. No. **2**, Q. No. **3** *or* Q. No.
4, Q. No. **5** *or* Q. No. **6**, Q. No. **7** *or* Q. No. **8**.

1. (*a*) Explain the need of modulation and the advantages of
modulation. [6]

(*b*) For a standard AM transmitter has un-modulated power output
of 100 W, when sinusoidally modulated signal the power
increases to 132 W, the transmitter feeds a resistance load
of 100 Ω.

Calculate :

(*i*) Modulation index;

(*ii*) Sketch the spectrum of AM signal with carrier 1 MHz
and modulating frequency of 10 kHz.

(*iii*) with trapezoidal method with practical modulation index
calculate V_{max} and $V_{min.}$ [6]

P.T.O.

2. (*a*) Describe the square law modulator using mathematical expression. [6]

(*b*) A carrier wave of frequency of a 1 MHz is frequency modulated by a size wave of amplitude of 10 V and 15 kHz. The frequency sensitivity of modulator is 3 kHz/V. [6]

(*i*) Determine the approximate bandwidth of FM using Carlson's rule.

(*ii*) Repeat part (*i*) assuming amplitude of modulating wave is doubled.

(*iii*) Repeat part (*i*) assuming frequency of modulating wave doubled.

3. (*a*) A radio receiver with 10 kHz bandwidth has noise figure of 30 dB. Determine the signal power at the output of the receiver to achieve input signal of noise ratio of 30 dB. [6]

(*b*) Draw and explain the functional block diagram of FM superheterodyne receiver. [6]

Or

4. (*a*) Draw the simple diode detector and explain the distortions that occur in it. [6]

(*b*) Write a note on types of Noise. [6]

5. (*a*) Explain the performance of FM in the presense of Noise. [7]

(*b*) Derive performance of Baseband system in the presense of noise. [6]

Or

6. (*a*) Write a note on Angle thresholding. [6]

(*b*) Derive performance of AM in presence of noise considering receiver as envelop detector. [7]

7. (*a*) Define time limited and Band limited signals, also justify that time limited signals. Cannot be band limited. [6]

(*b*) Draw and explain functional block diagram of PCM encoder and decoder. [7]

Or

8. (*a*) State sampling theorem ? With spectrum explain natural and flat top sampling. [7]

(*b*) Draw and explain with wave forms generation and Re-generation of PPM. [6]