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

Seat No.	

[5152]-138

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

ANALOG COMMUNICATION

(2012 PATTERN)

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

N.B. :— (*i*) 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**

(*ii*) Neat diagram must be drawn wherever necessary.

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

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

1. (*a*) State and compare different SSB generation methods. [6]

(*b*) Consider an angle modulated signal.

$x(t) = 10 \cos(\omega ct + 3 \sin \omega mt)$ assume PM and f_m = 1KHz. Calculate the modulation index and find the bandwidth when :

(*i*) Fm is doubled

(*ii*) Fm is decreased by one half [6]

Or

2. (*a*) An audio frequency signal $10 \sin(2\pi \times 500t)$ is used to amplitude modulate a carrier of $50 \sin(2\pi \times 10^5)$. Calculate :

(*i*) Modulation index

(*ii*) Sideband frequencies

P.T.O.

(*iii*) Amplitude of each sideband frequencies

(*iv*) Bandwidth

(*v*) Total power delivered to load of 600Ω

(*vi*) Transmission efficiency [6]

(*b*) Explain Armstrong method of FM generation. [6]

3. (*a*) Explain the following :

(*i*) Double spotting

(*ii*) Image frequency rejection

(*iii*) Fidelity [6]

(*b*) Three resistors have values R1 = 10 KΩ, R2 = 14 KΩ and R3 = 24 KΩ. It is known that thermal noise voltage generated by R1 is 0.3 μv. Calculate thermal noise voltage generated by :

(*i*) Three resistors connected in series

(*ii*) Three resistors connected in parallel. [6]

Or

4. (*a*) Explain with waveform and block diagram AM superheterodyne receiver. [6]

(*b*) Derive Friss formula for noise factor of cascaded amplifier. [6]

5. (*a*) Explain the performance of SSB-SC in presence of noise.[7]

(*b*) Explain importance of pre-emphasis and De-emphasis in FM system. [6]

Or

6. (*a*) Derive expression for signal to noise ratio in DSBSC system. [6]

(*b*) Explain the performance of FM in presence of noise. [7]

7. (*a*) State and prove sampling theorem with suitable waveform and mathematical expression. [7]

(*b*) What is aliasing ? How is it reduced ? [6]

Or

8. (*a*) Explain with the block diagram and waveform PAM. [6]

(*b*) With the help of block diagram explain transmitter and receiver of PCM. [7]