



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours/Programme 3rd Semester Examination, 2019

ELSHGEC03T/ELSGCOR03T-ELECTRONICS (GE3/DSC3)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

Answer Group-A (Question No. 1) and any six questions from Group-B

GROUP-A

1. Answer any **five** questions from the following: 2×5 = 10
- (a) What do you mean by base and side band signal?
 - (b) What do you mean by modulation index of amplitude modulation?
 - (c) What is demodulation?
 - (d) Define 'signal to noise ratio' and 'noise figure'.
 - (e) What do you mean by natural sampling?
 - (f) What is a channel? Give example.
 - (g) What is subsatellite point?
 - (h) What are the different frequency bands used in mobile communication?

GROUP-B

Answer any six questions from the following

5×6 = 30

2. Derive an expression for single-tone AM wave and draw its frequency spectrum. 5
3. (a) What do you mean by carrier wave and modulated wave? 2+3
- (b) Show that the total power of fully amplitude-modulated wave is 1.5 times the unmodulated carrier wave.
4. Explain the working principle of a rectifier detector for the detection of an AM wave. 5
5. A single-tone FM is represented by the voltage equations as: 5

$$V(t) = 12 \cos(6 \times 10^6 t + 5 \sin 1250 t)$$

Determine the following

- (i) Carrier frequency (ii) Modulating frequency (iii) Modulation index

6. Describe the working principle of a PAM system with proper diagram and waveforms. 5
7. (a) State sampling theorem. 2+3
(b) Distinguish between PAM, PPM and PWM techniques.
8. Draw the block diagram for the generation of PCM signal from an analog message signal and explain each and every block. 5
9. (a) What is multiplexing? State its importance. 2+3
(b) Explain the difference between TDM and FDM.
10. Explain radio frequency spectrum and its application in communication system. 5

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