(6 pages) Reg. No. : .....

Code No. : 20054 E Sub. Code : AEPH 52

B.Sc. (CBCS) DEGREE EXAMINATION, APRIL 2025.

Fifth Semester

Physics

Major Elective — COMMUNICATION ELECTRONICS

(For those who joined in July 2020 only)

Time : Three hours Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. If the frequency of the signal is 20 kHz, the length of the antenna is ————

(a) 3.85 km (b) 3.75 km

(c) 3.65 km (d) 3.95 km

2. In amplitude modulation the bandwidth is

(a) equal to the signal frequency

(b) twice the signal frequency

(c) thrice the signal frequency

(d) four times the signal frequency

3. In a radio receiver, noise is generally developed at

(a) IF stage (b) Receiving antenna

(c) Audio stage (d) RF stage

4. One of the following types of noise is of importance at high frequencies

(a) shot noise (b) impulse noise

(c) random noise (d) transit noise

5. In FM, the modulation index is

(a) $\frac{f_d}{f_m}$ (b) $\frac{f_m}{f_d}$

(c) $\frac{f_c - f_m}{f_m}$ (d) $\frac{f_m}{f_c - f_m}$

6. FM spectrum has

(a) two sidebands

(b) three sidebands

(c) no sidebands

(d) infinite number of side bands

7. When the modulating frequency is doubled, the modulation index has become half and the modulating voltage remains constant. The modulation system is

(a) amplitude modulation

(b) frequency modulation

(c) phase modulation

(d) any one of the above

8. One of the main function of the RF amplifier in a superheterodyne receiver of

(a) to provide improved tracking

(b) to permit adjascent channel rejection

(c) to increase the tuning range

(d) to improve image frequency rejection

9. Most commonly used digital modulation scheme is

(a) ASK (b) BFSK

(c) BPSK (d) DPSK

10. PSK is

(a) linear modulation

(b) non-linear modulation

(c) complex modulation

(d) none

PART B — ($5 \times 5 = 25$ marks)

Answer ALL questions, choosing either (a) or (b).

Each answer should not exceed 250 words.

11. (a) Define modulation index for AM wave.

Or

(b) Give the block diagram of AM transmitter and explain the function.

12. (a) Compare the various AM systems.

Or

(b) Explain TRF receiver.

13. (a) Define frequency modulation.

Or

(b) Explain commercial broadcast FM.

14. (a) Define balanced slope detector.

Or

(b) Explain FM noise suppression.

15. (a) Explain BFSK.

Or

(b) Describe digital modulation techniques.

PART C — (5 × 8 = 40 marks)

Answer ALL questions, choosing either (a) or (b)

Each answer should not exceed 600 words.

16. (a) Explain degrees of modulation.

Or

(b) Explain medium and high power AM modulator.

17. (a) What is meant by super heterodyne? Give the block diagram of a super heterodyne and explain its functions.

Or

(b) Derive an expression for double frequency conversion AM receiver.

18. (a) Explain the conversion of FM to PM.

Or

(b) Describe indirect method of FM wave generation.

19. (a) Explain ratio detector.

Or

(b) Draw and explain the block diagram of FM super heterogyne receiver.

20. (a) Explain correlative coding.

Or

(b) Explain duo binary encoding.

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