

Code No. : 20306 E Sub. Code : AEPH 52

B.Sc. (CBCS) DEGREE EXAMINATION,  
NOVEMBER 2022.

Fifth Semester

Physics

Major Elective – COMMUNICATION ELECTRONICS

(For those who joined in July 2021 onwards)

Time : Three hours

Maximum : 75 marks

PART A — (10 × 1 = 10 marks)

Answer ALL questions.

Choose the correct answer :

1. In India, \_\_\_\_\_ modulation is used for radio transmission.
  - (a) Frequency
  - (b) Amplitude
  - (c) Phase
  - (d) None of the above

2. The modulation index of an AM wave is changed from 0 to 1. The transmitted power is
  - (a) unchanged
  - (b) halved
  - (c) doubled
  - (d) increase by 50 percent
3. In a TRF radio receiver, the RF and detection stages are tuned to
  - (a) Radio frequency
  - (b) IF
  - (c) Audio frequency
  - (d) None of the above
4. Super hertodyne principle refers to
  - (a) Using a large number of amplifier stages
  - (b) Using a push-pull circuit
  - (c) Obtaining lower fixed intermediate frequency
  - (d) None of the above
5. When the modulating frequency is doubled, the modulation index is halved, and the modulating voltage remains constant. The modulation system is
  - (a) amplitude modulation
  - (b) phase modulation
  - (c) frequency modulation
  - (d) any of the three

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6. One of the following is an indirect way of generating FM. This is the
  - (a) Reactance FET modulator
  - (b) Varactor diode modulator
  - (c) Armstrong modulator
  - (d) reactance bipolar transistor modulator
7. In a broadcast superheterodyne receiver, the
  - (a) local oscillator operates below the signal frequency
  - (b) mixer input must be tuned to the signal frequency
  - (c) local oscillator frequency is normally double the IF
  - (d) RF amplifier normally works at 455 kHz above the carrier frequency
8. Since noise phase-modulates the FM wave, as the noise sideband frequency approaches the carrier frequency, the noise amplitude
  - (a) remains constant
  - (b) is decreased
  - (c) is increased
  - (d) is equalized
9. The maximum bandwidth is occupied by
  - (a) ASK
  - (b) BPSK
  - (c) FSK
  - (d) None of the above

10. The bandwidth of BFSK is \_\_\_\_\_ than BPSK.
  - (a) Lower
  - (b) Same
  - (c) Higher
  - (d) Not predictable

PART B — (5 × 5 = 25 marks)

Answer ALL questions, choosing either (a) or (b).  
Each answer should not exceed 250 words.

11. (a) Define Modulation Index. How do you calculate the modulation index for AM wave?  
Or  
(b) Describe about the broadcast AM Transmitter AM.
12. (a) Discuss about the Quadrature amplitude modulation.  
Or  
(b) Explain about the double frequency AM receiver.
13. (a) Summarize the theory of phase modulation.  
Or  
(b) Estimate the average power of an AM/FM wave.

14. (a) Develop the circuit of FM detector.

Or

(b) Evaluate the noise suppression for periodic signals using high-resolution frequency.

15. (a) Explain differential PSK.

Or

(b) Illustrate the examples of Duobinary encoding.

PART C — ( $5 \times 8 = 40$  marks)

Answer ALL questions, choosing either (a) or (b)  
Each answer should not exceed 600 words.

16. (a) Discuss about the power distribution in an amplitude modulated Wave.

Or

(b) Explain the function of AM transmitter.

17. (a) Sketch and explain the operation of AM receivers.

Or

(b) Explain about the basic principle of super heterodyne.

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18. (a) Illustrate the examples of frequency modulation.

Or

(b) Compare AM and FM.

19. (a) Define foster-seely discriminator and how does it work.

Or

(b) Explain clearly the basic principle of threshold extension using FMFB technique.

20. (a) Explain the working of binary phase shift keying (bpsk).

Or

(b) Draw and explain Mary FSK with block diagram.

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