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C20-EC–304

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BOARD DIPLOMA EXAMINATION, (C-20)

OCTOBER/NOVEMBER—2023

DECE - THIRD SEMESTER EXAMINATION

ANALOG AND DIGITAL COMMUNICATION SYSTEMS

Time : 3 Hours] [*Total Marks* : 80

PART—A 3×10=30

Instructions : (1) Answer **all** questions.

(2) Each question carries **three** marks.

(3) Answers should be brief and straight to the point and shall not exceed five simple sentences.

1. Draw the frequency spectrum of an AM wave. 3

2. State the condition for overmodulation and mention the effects of over-modulation. 1+2=3

3. List any three merits of FM over AM. 3

4. A 200 W carrier is modulated to a depth of 75%, calculate total side band power. 3

5. List any three advantages of digital communication system over analog communication system. 3

6. Define quantization noise. 3

7. Define overhead and efficiency of data communication system. 1½+1½=3

8. State the difference between bit rate and baud rate. 3

9. List the specifications of transmitters. 3

10. State the need for MODEM in data communication. 3

PART—B

8×5=40

Instructions : (1) Answer **all** questions.

(2) Each question carries **eight** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

11. *(a)* Derive the relation between total power and carrier power in AM. Calculate the percentage power save when carrier is removed at 100% modulation. 5+3=8

(OR)

(b) Derive time domain equation for FM wave. Define modulation index of FM. 6+2=8

12. *(a)* Define PWM and compare among PAM, PWM and PPM. 2+6=8

(OR)

(b) Describe the coding and decoding of a Pulse Code Modulation (PCM) signal. 8

13. *(a)* Draw the block diagram for high level modulated transmitter and explain its working. 3+5=8

(OR)

(b) Draw and explain the block diagram of indirect FM transmitter (Armstrong method). 4+4=8

14. *(a)* Explain the working of superheterodyne receiver with a block diagram. 5+3=8

(OR)

(b) Explain the process of demodulation with envelope detector in AM receivers. 8

15. *(a)* Explain the process of frequency division multiplexing with a block diagram. 8

(OR)

(b) State the need for multiplexing. Compare between FDM and TDM. 8

PART—C

10×1=10

Instructions : (1) Answer the following question.

(2) The question carries **ten** marks.

(3) Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer.

16. Explain checksum method of error detection for considering the following block of 24 bits is to be sent using a checksum of 8 bits. Data block :

10101101 00111001 10011010

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