Reg. No.												

Question Paper Code	**11676**

B.E. / B.Tech. - DEGREE EXAMINATIONS, NOV/DEC 2022
Fourth Semester
Electronics and Instrumentation Engineering
20EIPC403 - PRINCIPLES OF COMMUNICATION ENGINEERING
(Regulations 2020)

Duration: 3 Hours
Max. Marks: 100

PART - A (10 × 2 = 20 Marks)
Answer ALL Questions

Marks, K-Level,CO

1. Define modulation? And how they are classified. — *2,K1,CO1*
2. Draw the spectra of DSB-SC & SSB-SC. — *2,K1,CO1*
3. State Carson's rule for Bandwidth of FM wave. — *2,K1,CO2*
4. Obtain the bandwidth of the FM signal. $C(t) = 10\cos[2 \times 10^7 \pi t + 8\cos(1000\pi t)]$. — *2,K2,CO2*
5. How granular noise is reduced in Delta modulation? — *2,K2,CO3*
6. Discuss the applications of PCM. — *2,K2,CO3*
7. List the difference between ASK, FSK and PSK. — *2,K1,CO4*
8. Examine Eye pattern in digital communication. — *2,K1,CO4*
9. Express measure of information. — *2,K2,CO5*
10. Define entropy and its property. — *2,K1,CO5*

PART - B (5 × 13 = 65 Marks)
Answer ALL Questions

11. a) (i) Derive an expression for AM and the power distribution of AM. — *8,K2,CO1*

    (ii) Derive the modulation index in terms of envelope of AM. — *5,K2,CO1*

    OR

    b) Explain about Ring modulator and balanced modulator. — *13,K2,CO1*

12. a) Explain in detail about FM generation using indirect method. — *13,K2,CO2*

    OR

    b) Compare Amplitude modulation and Frequency modulation in detail. — *13,K2,CO2*

13. a) Summarize the types of multiplexing techniques with neat diagrams. — *13,K2,CO3*

    OR

    b) Explain the working of PAM modulator for natural PAM and flat top PAM. — *13,K2,CO3*

K1 – Remember; K2 – Understand; K3 – Apply; K4 – Analyze; K5 – Evaluate; K6 – Create

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14. a) Discuss the operation of a QPSK modulator and demodulator with a neat diagram. Draw its phasor and constellation diagram. *13,K2,CO4*

OR

b) (i) Explain how eye pattern is used to study the performance of a data transmission system *7,K2,CO4*

(ii) Write short notes on equalizer. *6,K2,CO4*

15. a) Consider a discrete memoryless source with seven possible symbols $X_i=\{1,2,3,4,5,6,7\}$ with associated probabilities $P_r=\{0.37,0.33,0.16,0.04,0.02,0.01\}$. Show the Huffman code, Shannon-fano code and determine the coding efficiency, redundancy. *13,K3,CO5*

OR

b) Interpret a single error correcting (7, 4) linear block code and the corresponding decoding table. *13,K2,CO5*

PART - C (1 × 15 = 15 Marks)

16. a) Illustrate the concept of the FHSS and DSSS communication system with suitable diagrams. *15,K2,CO6*

OR

b) (i) What are PN sequences? What are the properties of PN sequences? *5,K1,CO6*

(ii) What are the differences between FHSS and DSSS? *5,K1,CO6*

(iii) What are the advantages of spread spectrum? *5,K1,CO6*