Roll No. .....

3218

B. Tech. 5th Semester (ECE) Examination – March, 2021

COMMUNICATION ENGINEERING

Paper : PCC-ECE-305-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt *five* questions in all, selecting *one* question from each Section. Question No. 1 is ***compulsory***. All questions carry equal marks.

1. Explain the following : $2.5 \times 6 = 15$

(a) Correlation

(b) Entropy

(c) Noise

(d) Probability density function

(e) Statistical Average

(f) Error function

SECTION – A

2. What do you mean by Fourier Series ? How it is different from the Fourier Transform ? Explain with the help of taking suitable example of each. 15

3. Derive the Convolution theorem. Also describe the different applications of the convolution in communication in detail. 15

SECTION – B

4. (a) Describe and derive the Shannon-Hartley Theorem. Where is it being used ? Explain in detail. 10

   (b) Differentiate discrete and continuous channel in detail. 5

5. (a) Describe and derive the Shannon-Fano Coding by considering a suitable example in detail. 10

   (b) What do you mean by maximization of entropy of a continuous message ? Explain. 5

SECTION – C

6. Discuss the following :

   (a) Probability of Joint Occurrence 8

   (b) Probability distribution function. 7

7. What is the concept of Probability ? What is/are the representation of random signals ? Explain. 15

SECTION – D

8. Explain the following in detail : 8

   (a) Ergodic Processes

   (b) Centeral Limit Theory 7

9. Discuss the following in detail :

   (a) Linear Block Code Vs Cyclic Codes 5

   (b) Optimum Filter 5

   (c) Covariance relation among the spectral densities. 5

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3218

B. Tech. 5th Semester (ECE) Examination – February, 2022

COMMUNICATION ENGG.

Paper : PCC-ECE-305-G

Time : Three hours] *[Maximum Marks : 75*

Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.

Note : Attempt any *five* questions. All questions carry equal marks.

1. Define : $3 \times 5 = 15$

(a) Mean

(b) Entropy

(c) Probability

(d) Power spectral density

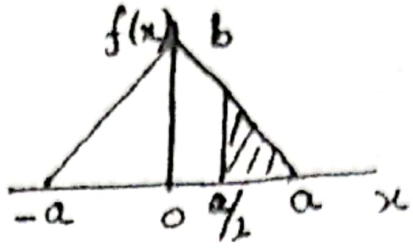
(e) Ergodic process

2. (a) Prove that Dirac comb is its own Fourier transform. 10

(b) What do you understand by convolution theorem ? Explain its properties. 5

3. Explain Auto correlation and its properties. 15

4. For the Pdf shown in fig. find : 15

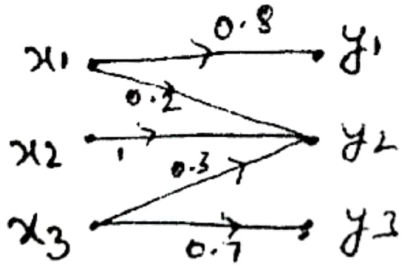


(a) Relationship between a and b.

(b) $P\left(x > \frac{a}{2}\right)$

5. Find the transferred information : 15

$P(x_1) = 0.2, P(x_2) = 0.5, P(x_3) = 0.3$



6. State and prove Shannon -Hartley Theorem ? 15

7. Apply Huffman coding for the following message ensemble : $[x] = [x_1 \quad x_2 \quad x_3 \quad x_4 \quad x_5 \quad x_6 \quad x_7]$

$[P] = [0.4 \quad 0.2 \quad 0.12 \quad 0.08 \quad 0.08 \quad 0.08 \quad 0.04]$

take M = 2 15

8. (a) What do you understand by central limit theorem ? 7.5

(b) Explain Linear Block code. 7.5

9. Write short note on any *two* : $7.5 \times 2 = 15$

(a) Entropy

(b) Variance

(c) Baye's theorem
