

Roll No.....  
Total No. of Questions: [09]

Total No. of Printed Pages: 1

**B. Tech ECE (Minor Engg.) (Semester – 7<sup>th</sup>)**  
**ELECTRONIC COMMUNICATION SYSTEM**  
**Subject Code: BECEM1003**  
**Paper ID: [ME111303]**

**Time: 03 Hours**

**Maximum Marks: 60**

**Instruction for candidates:**

1. Section A is compulsory. It consists of 10 parts of two marks each.
2. Section B consist of 5 questions of 5 marks each. The student has to attempt any 4 questions out of it.
3. Section C consist of 3 questions of 10 marks each. The student has to attempt any 2 questions.

**Section – A**

**(2 marks each)**

Q1. Attempt the following:

- a. Write the advantages of Delta Modulation over PCM.
- b. What is the modulation index in AM, and how is it defined?
- c. Define correlation receiver.
- d. What is channel capacity in the context of the Channel Coding Theorem?
- e. Define hamming distance and its role in error correction.
- f. Define Superheterodyne receiver and give a brief on its characteristics.
- g. How are symbols arranged in Shannon-Fano coding?
- h. Define entropy and its applications.
- i. What is a parity-check matrix in block codes?
- j. Define and classify pulse modulation.

**Section – B**

**(5 marks each)**

- Q2. Explain the working of FM demodulator contains phase lock loop with the help of suitable block diagram.
- Q3. Explain coherent and non-coherent Ask detector in detail.
- Q4. Compare narrowband FM with wideband FM w.r.t following points:
  - (a) Modulation index
  - (b) Maximum deviation
  - (c) Range of modulating frequency
  - (d) Application
- Q5. Explain DPCM transmitter and receiver in detail.
- Q6. Why do we prefer ADM instead of DM? How Slope over load distortion and Granular noise are avoided in ADM?

**Section – C**

**(10 marks each)**

- Q7. Construct the Huffman code with minimum code variance for the following probabilities and also determine the code variance and code efficiency:  
{0.25, 0.25, 0.125, 0.125, 0.125, 0.625, 0.625}
- Q8. (a) Discuss the principle of FM generation using direct method. State merits and demerits of this method.  
(b) What are the limitaions of Amplitude modulation?
- Q9. (a) Explain the structure and working of linear block codes with an example.  
(b) Compare convolutional codes and block codes in terms of structure, encoding and error Correction.