Roll No…….. **Total No. of Printed Pages: 1**

Total No. of Questions: [09]

BBA (Semester: 6th)

COMMUNICATION SYSTEMS

Subject Code: BECE0-F94

Paper ID: [OE2150108]

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) Define modulation in communication systems.

b) What is the significance of noise in communication?

c) Derive the expression for Amplitude Modulation (AM).

d) What is the modulation index in AM?

e) Explain the power distribution in an AM signal.

f) Describe DSB-SC, SSB and VSB AM.

g) Explain the operation of an envelope detector.

h) What is the relationship between Phase Modulation and Frequency Modulation?

i) Define quantization noise in digital communications.

j) What are the key properties of line coding schemes?

Section – B **(5 marks each)**

Q2. Explain the operation of a balanced modulator and provide its circuit diagram.

Q3. Define frequency modulation. If a frequency-modulated signal has a peak frequency deviation of 3 kHz and modulating signal frequency of 1 kHz, calculate the modulation index for FM.

Q4. Discuss the process of Delta Modulation (DM) and compare it with PCM.

Q5. Describe the process of Pulse Code Modulation (PCM) and its significance.

Q6. Find the power spectral density of an ON-OFF signaling line code.

Section – C **(10 marks each)**

Q7. Discuss the complete modulation process, including modulation index, power distribution and bandwidth in AM. If an AM signal has a carrier power of 100 W and a modulation index of 0.5. Calculate the power in the sidebands.

Q8. Compare and contrast the characteristics of Phase Modulation and Frequency Modulation with relevant diagrams.

Q9. Provide a detailed analysis of the different line coding schemes and their properties.