T.E. ECS SEM V / June 2026 / C-Scheme

Duration: 3hrs **[Max Marks: 80]**

03/06/26.

N.B.: (1) Question No 1 is Compulsory.
(2) Attempt any three questions out of the remaining five.
(3) All questions carry equal marks.
(4) Assume suitable data, if required and state it clearly.

1 Briefly explain any FOUR **[20]**
- a Define bandwidth and explain its significance in communication systems
- b Explain phase distortion and its effect on signal transmission
- c What is coherent detection? Give its advantages
- d Explain the concept of symbol rate vs bit rate
- e Define cross talk and methods to reduce it.

2 a Derive the power distribution in AM (DSB-FC) and show that most power is wasted in carrier. **10**

b Explain the working of a square law detector for demodulation of AM signal with equations. **10**

3 a Explain the generation and detection of DPSK (Differential Phase Shift Keying) with block diagrams. **10**

b For the bit sequence 10101100, draw the following: **10**
1. Unipolar NRZ
2. Polar NRZ
3. Bipolar RZ
4. Manchester encoding

4 a Explain the working of an FM demodulator using PLL with block diagram **10**

b Describe the noise performance of communication systems, defining noise temperature and noise bandwidth. **10**

5 a Explain Time Division Multiplexing (TDM) in detail and compare it with statistical TDM. **10**

b Derive the Nyquist criterion for zero ISI and explain its importance in digital communication. **10**

6 Write short notes on any FOUR. **20**
- a Envelope detector limitations.
- b Quantization noise in PCM.
- c Pre-emphasis and De-emphasis in FM systems.
- d Eye diagram and its interpretation.
- e Automatic Gain Control (AGC).

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