Roll No.												

PRESIDENCY UNIVERSITY

BENGALURU

Mid - Term Examinations – October 2025

Date: 08-10-2025 **Time:** 09.30am to 11.00am

School: SOE	**Program:** ECE (3VLSI01)	
Course Code : ECE2517	**Course Name:** Communication Systems	
Semester: III	**Max Marks**: 50	**Weightage**: 25%

CO - Levels	**CO1**	**CO2**	**CO3**	**CO4**	**CO5**
Marks	**16**	**17**	**17**	**---**	**---**

Instructions:

(i) Read all questions carefully and answer accordingly.

(ii) Do not write anything on the question paper other than roll number.

Part A

Answer ALL the Questions. Each question carries 2marks. **5Q x 2M=10M**

1	Define modulation index in the context of amplitude modulation.	**2 Marks**	**L1**	**CO1**
2	Describe the main advantage of Double Sideband Suppressed Carrier AM over Full Carrier AM.	**2 Marks**	**L2**	**CO1**
3	Identify the main components of a ring modulator.	**2 Marks**	**L1**	**CO1**
4	Find the frequency deviation in an FM signal if the modulation index is 3 and the modulating frequency is 8 kHz.	**2 Marks**	**L1**	**CO3**
5	Find the transmitted power if the carrier power is 50 KW and the modulation index is 0.6	**2 Marks**	**L1**	**CO2**

Part B

Answer the Questions. **Total Marks 40M**

6.	Describe the role of the diode and how the switching modulator produces AM signals.	**10 Marks**	**L2**	**CO1**
	Or			
7.	Discuss how carrier suppression is achieved in a balanced modulator.	**10 Marks**	**L2**	**CO1**

8.	Given an amplitude modulated wave expressed as $s(t) = [25(1+0.8\cos 16000t)\cos 3x10^5 t]$ volts Apply your understanding of amplitude modulation to answer the following: **(a)** Identify the frequency components contained in the AM wave. **(b)** Calculate the minimum and maximum amplitudes of the AM wave. **(c)** Determine the amplitude of the carrier signal, the message signal, and the AM wave. **(d)** Calculate the transmission efficiency during AM wave transmission. **(e)** Calculate the bandwidth required for transmission of the AM wave.	**15 Marks**	**L3**	**CO2**
	Or			
9.	An audio frequency signal $35\sin(2\pi \times 20\ x10^3\ t)$ volts modulates a carrier signal $75\sin(2\pi \times 12\ x10^6 t)$ volts. Calculate: **(a)** Modulation Index **(b)** Sideband frequencies **(c)** Amplitude of each sideband frequency **(d)** Bandwidth required **(e)** Total power delivered to the load of 1K ohms **(f)** Efficiency of the modulation	**15 Marks**	**L3**	**CO2**

10.	Describe the process for generating narrowband frequency modulation (NBFM) and include the relevant equation and block diagram in your explanation.	**15 Marks**	**L2**	**CO3**
	Or			
11.	Derive the mathematical expression for a single-tone sinusoidal frequency modulated (FM) wave and explain the characteristics of its frequency spectrum.	**15 Marks**	**L2**	**CO3**