Roll No: | | | | | | | | | | | |

GAIN MORE KNOWLEDGE
REACH GREATER HEIGHTS

PRESIDENCY UNIVERSITY

Presidency University Act, 2013 of the Karnataka Act No. 41 of 2013 | Established under Section 2(f) of UGC Act, 1956
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Bengaluru

Mid Term Examinations - October 2026

Date: 06/10/2026 **Time:** 11:45 AM - 01:15 PM

Course Code: ECE2517 **Course Name:** Communication Systems

Semester: Third Semester **Max. Marks:** 50 **Weightage:** 50%

CO - Levels	CO1	CO2	CO3
Marks	2	42	46

PART A: Answer Following Questions. 10 M

Q.N.	Questions	M	CO	BT
1	A 1000 kHz carrier is simultaneously modulated by 300 Hz, 800 Hz and 2 kHz audio sine waves. What will be the number of frequency content of the AM signal?	2	CO2	BT3
2	A broadcast AM transmitter radiates 50 kW of carrier power. What will be the radiated power at 85% modulation?	2	CO1	BT2
3	Discuss the properties of angle modulated wave (4 POINTS)	2	CO3	BT1
4	Draw and explain the phasor diagram of NBF modulation.	2	CO3	BT1
5	A 20 MHz carrier is modulated by a 400 Hz modulating signal. The carrier voltage is 5 V and maximum deviation is 10 kHz. Write down the mathematical expression for the FM wave.	2	CO3	BT3

PART B : Answer Any 1 Following Questions. 10 M

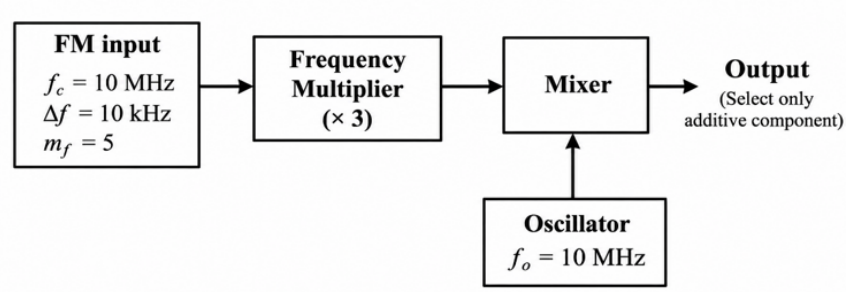
Q.N.	Questions	M	CO	BT
6	Explain Weaver's Method for SSB-SC generation with a neat block diagram. Derive the expression for the generated Single Sideband (SSB) signal and explain its operation.	10	CO2	BT2

PTO (Please Turn Over)

7	**1) Consider the message signal** $$m(t) = 20\cos(2\pi t) \text{ volts}$$ **and the carrier wave** $$c(t) = 50\cos(100\pi t) \text{ volts}$$ **a) Determine the resulting AM wave for 75% modulation.** **b) Find the power developed across a load of 100 Ω due to this AM wave.** **2) Explain the demodulation of an SSB-SC signal with the help of a suitable block diagram and mathematical expression**	10	CO2	BT3

PART C: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
8	**1) The amplitude modulated signal is given by** $$S(t) = 10\cos(2\pi 10^6 t) + 5\cos(2\pi 10^6 t)\cos(2\pi 10^3 t) + 2\cos(2\pi 10^6 t)\cos(4\pi 10^3 t) \text{ volts.}$$ **Find the various frequency components present and the corresponding modulation indices. Draw the line spectrum and find the bandwidth.** **2) Explain phase shift method of SSB generation.**	10	CO2	BT3
9	**In an AM signal, the amplitude of the Upper Sideband (USB) is attenuated by a factor of 2. Determine the complex envelope and its magnitude if $A_c = 1$V and $m = \frac{1}{2}$**	10	CO2	BT3

PART D: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**

10	**1) The equation for an FM wave is** $$s(t) = 10\cos[5.7 \times 10^8 t + 5\sin(12 \times 10^3 t)]$$ **Calculate:** **i. Carrier frequency** **ii. Modulating frequency** **iii. Modulation index** **iv. Frequency deviation** **v. Power dissipated in a 100 Ωresistor load** **2) In the block diagram shown below, find out the carrier frequency, frequency deviation and modulation index at the output of a mixer. Assume that the mixer will select only the additive frequency component.** 	10	CO3	BT3
11	**With a neat block diagram, explain the Armstrong method of indirect FM generation. Derive the expression for the FM wave obtained and explain the function of each block in the system. Mention the advantages and disadvantages of the Armstrong method.**	10	CO3	BT2

PART E: Answer Any 1 Following Questions. 10 M				
Q.N.	**Questions**	**M**	**CO**	**BT**
12	**Explain the operation of Foster–Seeley discriminator with the following:** **(i) Schematic diagram** **(ii) Vector diagrams for:** • $f_{in} = f_0$ • $f_{in} < f_0$ • $f_{in} > f_0$	10	CO3	BT2
13	**Explain FM Detection by** **1. Zero crossing detector.** **2. PLL**	10	CO3	BT2