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**PRESIDENCY
UNIVERSITY
BENGALURU**

School of Engineering

Mid - Term Examinations - November 2024

Semester: 5

Date: 04/11/2024

Course Code: ECE3005

Time: 02.00pm to 03.30pm

Course Name: Analog Communication

Max Marks: 50

Program: Electronics & Communication Engineering

Weightage: 25%

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.

5QX2M=10M

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|----------|---|---------|----|-----|
| 1 | Outline the classification of Analog Communication systems. | 2 Marks | L1 | CO1 |
| 2 | Define Amplitude Modulation Index. What is the value of modulation index for critical modulation condition? | 2 Marks | L1 | CO1 |
| 3 | Name the two types of detectors used to demodulate Amplitude Modulated signal. | 2 Marks | L1 | CO1 |
| 4 | Give the expression for Frequency Modulation by defining all the parameter representations. | 2 Marks | L1 | CO2 |
| 5 | Differentiate between narrow band FM and wideband FM. | 2 Marks | L1 | CO2 |

Part B

Answer ALL Questions. Each question carries 10 marks.

4QX10M=40M

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|----------|---|---------|----|-----|
| 6 | a. Discuss in detail the elements of communication system with the help of a neat diagram block diagram. | 8 Marks | L2 | CO1 |
| | b. List any two applications of AM. | 2 Marks | L2 | CO1 |

Or

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|----------|---|---------|----|-----|
| 7 | a. The communication is more efficient if modulated before transmission. Justify this statement of need of communication system. | 8 Marks | L2 | CO1 |
|----------|---|---------|----|-----|

	b.	Draw neat waveforms of Amplitude modulated signal.	2 Marks	L2	C01
8		Frequency modulation (FM) can be categorized into Narrowband FM (NBFM) and Wideband FM (WBFM), depending on the modulation index and bandwidth requirements. Explain the key differences in the generation of NBFM and WBFM using direct and indirect method with neat diagram	10 Marks	L3	C02
		or			
9	a.	Calculate the permissible range in maximum modulation index for i) Commercial FM which as 30 Hz to 15 kHz modulating frequency ii) NBFM System which allows maximum deviation of 10kHz for 100Hz to 3kHz modulating frequencies.	6 Marks	L2	C02
	b.	Draw neat waveforms of Frequency modulated signal	4 Marks	L2	C02
10		Show that in an envelope detector circuit the demodulation is to follow the envelop of $m(t)$, it is required that at any time	10 Marks	L3	C01
		$\frac{1}{RC} \geq \frac{\mu\omega_m \sin\omega_m t}{1 + \mu\cos\omega_m t}$			
		Or			
11	a.	Discuss the generation of DSBSC waves using balanced modulator with the help of a neat diagram.	4 Marks	L2	C01
	b.	Explain SSBSC demodulation using Coherent detector	6 Marks	L2	C01
12	a.	What is meant by the terms, angle modulation and frequency deviation? Give the mathematical relationship for same.	4Marks	L2	C02
	b.	Compare in detail Amplitude modulation and frequency modulation.	6 Marks	L2	C02
		Or			
13		Derive the expression for Single tone frequency modulation. Also highlight on frequency modulation index.	10Marks	L3	C02