

**BONAM VENKATA CHALAMAYYA INSTITUTE OF TECHNOLOGY & SCIENCE
(AUTONOMOUS)**

II-B. Tech II-Semester Supplementary Examinations (BR23), Aug - 2025

ANALOG COMMUNICATIONS (ECE)

Time: 3 hours

Max. Marks: 70

*Question Paper consists of Part-A and Part-B
Answer ALL the question in Part-A and Part-B*

PART-A (10X2 = 20M)

	Marks	CO	BL
1. a) What is the need for modulation? Explain the main advantages of modulation?	(2M)	CO1	BL2
b) As related to AM, what is over modulation, under modulation and 100% modulation?	(2M)	CO1	BL2
c) Plot the DSB-SC wave with a square-wave modulating signal.	(2M)	CO2	BL3
d) Why is VSB modulation used in TV transmission?	(2M)	CO2	BL3
e) What are the advantages of FM over AM?	(2M)	CO3	BL2
f) What is the bandwidth required for an FM wave in which the modulating frequency signal is 2 KHz and the maximum frequency deviation is 12 KHz?	(2M)	CO3	BL3
g) What are the advantages of Super heterodyne receiver over Tuned radio frequency receiver?	(2M)	CO4	BL2
h) Write in detail about the limiter used in FM receiver.	(2M)	CO4	BL1
i) Define noise figure and what is its significance	(2M)	CO5	BL2
j) Write short notes on Double polarity PAM.	(2M)	CO5	BL1

PART-B (5X10 = 50M)

2 a.	What is single tone modulation and derive an expression for single tone amplitude modulated signal?	(5M)	CO1	BL2
b.	A modulating signal of $2\cos(5000t)$ is amplitude modulated over a carrier signal of $5\cos 20000t$. Find the modulation index, LSB and USB frequencies, and bandwidth.	(5M)	CO1	BL3
(OR)				
3 a.	With the help of waveforms and spectrum, describe the concept of Amplitude modulation both in time domain and frequency domain.	(5M)	CO1	BL4
b.	Explain how an AM wave is generated using switching modulator.	(5M)	CO1	BL3
4 a.	Draw the circuit diagram for ring modulator and explain its operation indicating all the waveforms.	(5M)	CO2	BL2
b.	Explain how a DSB-SC signal is detected using a coherent detector.	(5M)	CO2	BL2
(OR)				
5a.	How is SSB signal generated by Phase discrimination method? Explain with neat sketch.	(5M)	CO2	BL3
b.	Explain the detection of VSB signal using envelope detector.	(5M)	CO2	BL3

6a.	Explain the necessity of each block of indirect FM generation method.	(5M)	CO3	BL2
b.	Discuss the process of detection of FM waves by phase locked loop.	(5M)	CO3	BL3
(OR)				
7a.	Derive the expression for single - tone frequency modulation with necessary waveforms.	(5M)	CO3	BL4
b.	A 20 MHz carrier is frequency modulated by a sinusoidal signal such that the peak frequency deviation is 100 KHz. Determine the modulation index and the approximate bandwidth of the FM signal if the frequency of the modulating signal is: (i) 1 KHz (ii) 15 KHz	(5M)	CO3	BL3
8a.	Explain the effect of feedback on the performance of AM transmitter.	(5M)	CO4	BL4
b.	What is AGC in AM receivers? Draw and explain different AGC characteristics.	(5M)	CO4	BL3
(OR)				
9a.	Describe the operation of variable reactance type and phase modulated FM transmitter.	(5M)	CO4	BL4
b.	In a broadcast Super Heterodyne Receiver having no RF amplifier is tuned to 555 KHz. The local oscillator frequency is adjusted to 1010kHz and the quality factor is 100. Calculate the intermediate frequency, image frequency and image rejection ratio.	(5M)	CO4	BL3
10 a.	Explain different sources of noise.	(5M)	CO5	BL1
b.	With suitable block diagram and waveforms explain the four channel time division multiplexing system?	(5M)	CO5	BL3
(OR)				
11a.	Explain about noise effect in AM and obtain expression for figure of merit.	(5M)	CO5	BL2
b.	Explain how PPM can be generated from PWM signals.	(5M)	CO5	BL4
