SCHOOL OF ELECTRONICS ENGINEERING

CONTINUOUS ASSESSMENT TEST - I

WINTER SEMESTER 2025-2026

SLOT: B1+TB1

Programme Name & Branch :B.Tech & Electronics and Communication Engineering
Course Code and Course Name : BECE304L - Analog Communication Systems
Faculty Name(s) : Dr.T. Shankar,Dr.K.V.N.Kavitha, Dr.G.Aarthi, Dr.D.Vijendra Babu, Dr. M Karthikeyan, Dr. Dilip Kumar Choudhary
Class Number(s) : VL2025260500748, 0763, 0767 , 0776, 0770, 0779
Date of Examination : 28-01-2026 (9:30 AM to 11.00AM)
Exam Duration : 90 minutes **Maximum Marks: 50**

General instruction(s):

- **Answer All Questions**
  Assume any missing data, appropriately. Provide illustration, wherever necessary.
- **Course Outcomes (CO):**
  CO 1. Explain the key elements of communication systems.
  CO 2. Examine the amplitude modulation schemes and their performance metrics.

Q. No	Question	M	CO	BL
1.	a) Differentiate between baseband and passband transmission with sufficient block diagram of analog communication systems. Explain the functions of each block. [5] b) Determine the practicability of the antenna for the transmission of voice signal at carrier frequency of 2000Hz and 100MHz. Estimate the antenna height considering a di-pole Antenna. [5]	10	1	2
2.	One input to a conventional AM modulator is a 500 kHz carrier with an amplitude of $20V_p$. The second input is 10 kHz modulating signal that is of sufficient amplitude to cause a change in the amplitude of output wave is $\pm 7.5\ V_p$. Determine i) Upper and lower sideband frequencies. ii) Modulation coefficient and percent modulation iii) Peak amplitude of the modulated carrier and the upper and lower side frequency voltages iv) Maximum and minimum amplitude of the modulated envelope. v) Expression for the modulated wave	10	2	3
3.	a)A signal $x_c(t) = 5[1 + 2\cos\omega_m t]\cos\omega_c t$ is to be demodulated. Identify the suitable detectors can be used with suitable justification (i)Envelope Detector, (ii)Square-law Detector (iii)Synchronous Detector. [5] b) A Diode detector load consists of a 0.01μF capacitor in parallel with a 5-kΩ resistor. Determine the maximum depth of sinusoidal modulation that the detector can handle without diagonal clipping when the modulating frequency is (i)1 kHz and (ii)10 kHz. [5]	10	2	3

VIT

Vellore Institute of Technology
(Deemed to be University under section 3 of UGC Act, 1956)

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4.	a) Explain the generation of SSB-SC -LSB wave with neat diagram and derive an expression using phase shift method. [5] b) A 400 W carrier is amplitude modulated to a depth of 100%. Calculate the total power in case of AM and DSBSC techniques. How much power saving (in W) is achieved for DSBSC? If the depth of modulation is changed to 75%, then how much power (in W) is required for transmitting the DSBSC wave? Compare the powers required for DSBSC in both the cases and comment on the reason for change in the power levels. [5]	10	2	3
5.	a) The Weaver's method of SSB generation uses an audio carrier frequency of 2.5 kHz and a radio carrier frequency of 250 kHz. Audio signal of 4000 Hz is fed as input to the modulator. (i)Find the frequencies of all the components present in the output signal of USB and LSB. (ii)Sketch the spectrum and show all the frequencies in part (i). [5] b) Compute the demodulated signal y(t) from Figure 1. The Double-Sideband Suppressed Carrier (DSB-SC) modulated, $s(t)=4\cos 2\pi 400t\ (2\cos 4000\pi t)$ where the Balanced modulated carrier signal $c(t)=2\cos 4000\pi t$. [5]	10	2	3

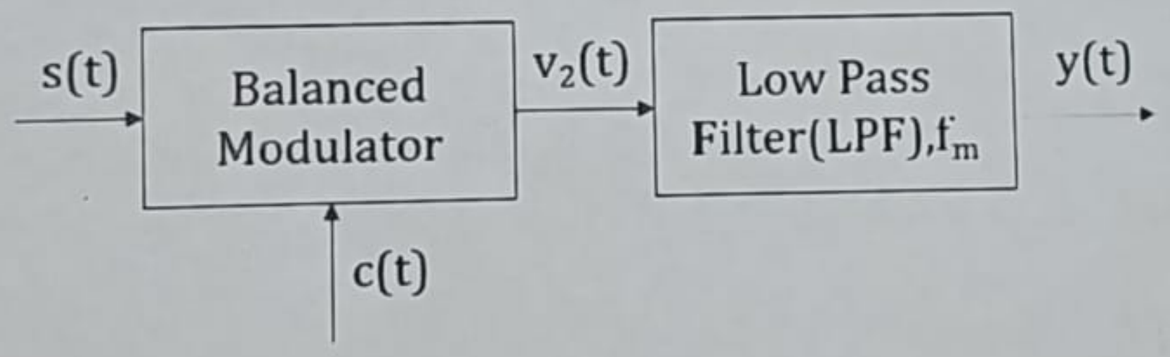

Figure 1 Synchronous Detector