	amplifier is connected to signal source of 50 ohm resistance at 290 K.	
	b) Thermal noise voltage (r.m.s.) across a resistor has been found to be 10 microvolts at a temperature of 77^0 C and over the bandwidth 10 kHz. Compute its resistance?	5

School of Electronics Engineering

B.Tech *(Electronics and Communication Engineering)*

Continuous Assessment Test – I [Winter Semester 2022-23]

Course Name: Analog Communication Systems **Course Code:** BECE 304L

Slot: G1 **Exam Duration:** 90 Min

Maximum Marks: 50

General instruction(s):

Assume constants whenever it is needed.

S.No.	Question	Mark
1.(i)	a) Find the practicality of length of the antenna for the transmission of voice signal at carrier frequency of 1000 Hz and 200 MHz? b) Find the Voltage gain ratio and the dB equivalent if the input and output voltages are 3 V and 10 V respectively.	5
1.(ii)	A signal is given as $x(t) = \cos(\omega_0 t)$. Determine if it is an Energy Signal or a Power signal.	5
2.	An audio frequency signal $10\sin(2\pi 50t)$ is used to amplitude modulate a carrier of $50(\sin 2\pi 10^5 t)$. Calculate a. Modulation Index b. Side band frequencies c. Amplitude of each side band frequencies and sketch the spectrum d. Bandwidth required e. Total power delivered to the load of 600 Ω f. Transmission efficiency	10
3.	Explain how Amplitude modulated signal is generated using a Square law modulator with necessary block diagram and mathematical derivation.	10
4.(i)	An AM signal $s(t) = 4\cos(1800\pi t) + 10\cos(2000\pi t) + 4\cos(2200\pi t)$ is demodulated by using the envelope detector at the receiver. What is the satisfactory range of the RC time constant?	5
4.(ii)	Explain the effect of the RC time constant on the efficient operation of the envelope detector.	5
5.	For the modulated DSB- SC signal $x(t) = m(t)\cos(2\pi f_c t)$, the message signal $m(t) = 4\cos(1000\pi t)$ and the carrier frequency f_c is 1 MHz. The signal is passed through a demodulator, as shown in the Figure 1. Find the output of the demodulator.	10

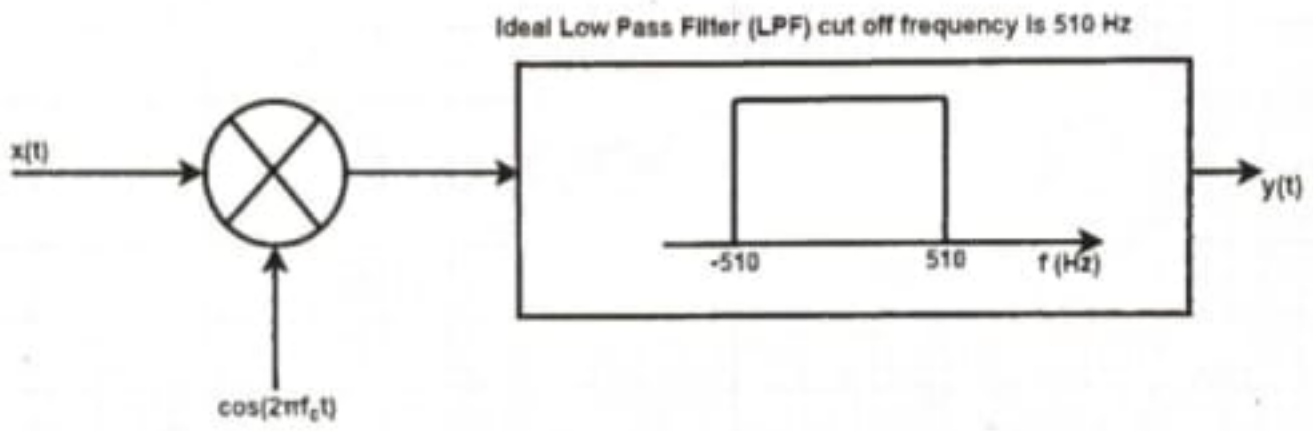

Figure 1