

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -I EXAMINATION- 2023

B.Tech-I Semester (ECM)

COURSE CODE(CREDITS): 20B11EC512 (3)

MAX. MARKS: 15

COURSE NAME: Communication Systems

COURSE INSTRUCTORS: Lt. Pragya Gupta

MAX. TIME: 1 Hour

*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

**Q1. (a)** The antenna current of an AM transmitter is 8A when only the carrier is sent, but it increases to 8.93A when a single sine wave modulates the carrier. Find the percentage modulation. Determine the antenna current when the percentage of modulation changes to 0.8.

[2]CO2

**(b)** Define the following terms

(i). Modulation and Demodulation

(ii). Modulation Index and its range

(iii). DSB-SC and SSB-SC

[3]CO1

**Q2.(a)** A carrier wave of frequency  $f = 1\text{MHz}$  with a peak voltage of 20V is used to modulate a signal of frequency 1kHz with a peak voltage of 10v. Find out the following:

(i) Modulation index (ii) Frequencies of the modulated wave (iii) Bandwidth [3]CO2

**(b)** Explain the method of generating AM waves using a Non-Linear Device. [2]CO1

**Q3.(a)** Why are carrier waves of higher frequency compared to modulating signals?

**(b)** Why is the amplitude of the modulating signal kept less than the amplitude of the carrier wave? [2]CO1

**Q4.** With the help of mathematical equations and a block diagram explain the phase discrimination

method to generate SSB-SC. [3]CO2