

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

B.Tech-I Semester (ECS)

COURSE CODE (CREDITS): 25B11EC514 (4)

MAX. MARKS: 15

COURSE NAME: Analog and Digital Communication

COURSE INSTRUCTOR: Dr. Alok Kumar

MAX. TIME: 1 Hour

Note: (a) All questions are compulsory.

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

(c) Use of calculator is allowed

Q.No	Question	CO	Marks
Q1	Why can't an audio signal of 3 kHz be transmitted directly over a long distance using a practical antenna? Two radio stations transmit audio signals simultaneously. What problem will occur if modulation is not used? How does modulation solve this problem?	1	[3]
Q2	What is a band-limited signal? Why are practical communication signals generally band-limited?	1	[2]
Q3	Why is the carrier suppressed in DSB-SC modulation? Explain how carrier suppression improves power efficiency. Also draw the frequency spectrum of a DSB-SC signal for $m(t) = 3 \cos(2\pi 500t)$ and $C(t) = 30 \cos(2\pi 100000t)$.	1	[3]
Q4	a) The percentage power saving when the carrier and one of the side bands are suppressed in an AM wave modulated to a depth of 50%? b) A carrier is amplitude modulated to a depth at 40 % . What is the % increase in power of modulated signal.	1	[2]
Q5	Explain the generation of an SSB-SC signal using the phase-shift method with a neat block diagram. Describe the operation of each block and derive the mathematical expression for the generated SSB-SC signal.	1	[3]
Q6	What happens to the demodulated signal if there is a phase difference between the received carrier and the locally generated carrier? Explain.	1	[2]