

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

Test 1 Examination – 2015

B.Tech (CSE & IT) Vth Semester

COURSE NAME : COMMUNICATION SYSTEMS

MAX. MARKS: 15

COURSE CODE: 10B11EC514

COURSE CREDITS: 04

MAX. TIME: 1 HRS

Note: All questions are compulsory. Carrying of mobile phone during examination will be treated as case of unfair means. Marks are indicated against each question.

- Q 1.** What do you mean by modulation? Discuss the need of modulation in communication system. (1+2 =3)
- Q 2.** Prove by deriving the expression of double side band-full carrier (DSB-FC) amplitude modulation that it is a linear modulation scheme. What are the limitations of this modulation scheme? What is the effect of overmodulation in this modulation scheme? (1+1+1 =3)
- Q 3.** A detector has been designed to demodulate DSB-SC signal. The carrier signal generated at receiver is not fully synchronized with the carrier signal used at transmitter for modulation. Derive an expression for the detection of DSB-SC signal for the given scenario. Discuss the consequences in detail. (3)
- Q 4.** If a carrier signal $10 \cos 2\pi \cdot 10^6 t$ is modulated by a message signal $4 \cos \pi \cdot 10^3 t + 2 \cos 2\pi \cdot 10^3 t$. Then find the bandwidth, sideband powers, efficiency, and total power of AM transmitted signal. (0.5+1+1+0.5=3)
- Q 5.** A commercial amplitude modulated transmitter has an unmodulated carrier power level of 1 kW and the antenna presents a sensitive load of resistance 50Ω to the transmitter at the operating frequencies for both 40 % and 80% modulation. Calculate the : a) total average power b) peak envelope power and c) Comment on the results. (1+1+1 =3)