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JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATIONS-2022

B.Tech-IV Semester (ECE/CSE/IT)

COURSE CODE: 18B11EC413

MAX. MARKS: 15

COURSE NAME: Modern Analog and Digital Communication

COURSE CREDITS: 4

MAX. TIME: 1 Hour

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means. Marks are indicated against each question in square brackets. CO stands for Course Outcomes.

- Q1(a). How is bandwidth defined in communication system? CO-1 (1 mark)
- Q1(b). Can 2 composite signals possessing different spectrums have same bandwidth? Justify your answer with the help of an example depicting 2 different signals with their spectrums. CO-1 (1 mark)
- Q2. Define modulation. Why is modulation required in communication systems? CO-1&2 (1+2 = 3 marks)
- Q3. Is amplitude modulation linear or non-linear? Prove by deriving an expression for amplitude modulated (AM) signal. What is the drawback of AM and how can it be overcome? CO-2 (2+1 = 3 marks)
- Q4. How can AM signal be demodulated using square-law detector? CO-2 (2 marks)
- Q5. Show that for 100% modulation, each side band contains one-sixth of total power. CO-2 (2 marks)
- Q6. An AM signal is represented by the expression:
- $$V_{AM} = 10 [1 + 0.7 \cos(6280t)] \cos(2\pi \cdot 10^4 t) \text{ volts}$$
- i) What is the minimum and maximum amplitude of AM wave?
- ii) What frequency components are contained in the modulated wave?
- iii) What is the amplitude of sidebands? CO-2 (3*1 = 3 marks)