JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- 2025

B.Tech- IV Semester (ECE, CSE)

COURSE CODE (CREDITS): 18B11EC413 (4)   MAX. MARKS: 35

COURSE NAME: Modern Analog and Digital Communication

COURSE INSTRUCTORS: Dr. Alok Kumar   MAX. TIME: 2 Hours

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

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

Q.No	Question	CO	Marks
Q1	Explain how image frequency signals are received in a superheterodyne receiver. How can these signals be rejected? For an AM superheterodyne receiver the IF frequency is 700 KHz. Determine the image frequency at received signal frequency of 940 KHz.	1	3
Q2	How PPM signals can be generated from PAM signals?	2	3
Q3	What is Intersymbol interference (ISI)? What are different ways to reduce the effects of ISI?	4	3
Q4	An audio signal $m(t) = 3\cos(2\pi 500 t)$ is quantized using 10 bit PCM. Determine the signal to quantization noise ratio in dB?	3	3
Q5	Why is predictor used in DPCM? What is the advantage of DPCM over PCM?	3	3
Q6	Draw the waveform for binary data sequence 1110010 using a) Unipolar RZ b) Polar NRZ, c) Polar RZ d) Manchester e) Differential Manchester f) Bipolar AMI RZ	3	3
Q7	What is digital modulation? How is it different from analog modulation? What are the difference between Bit rate and Baud rate? Sketch the waveform for the binary sequence 11001 using: a) FSK , and b) PSK	4	4
Q8	What is a matched filter? State the purpose of a matched filter in digital communication. What is the impulse response of a matched filter?	5	4
Q9	Explain the working principal of delta modulation with the help of a suitable block diagram and necessary equations. What are errors occur in delta modulation?	5	5

Q10	Consider an analog input signal to PCM whose bandwidth is limited to 4 KHz and varies in amplitude from -3.8V to +3.8V, with an average power of 30mW. The required signal to quantization error ratio is given to be 20dB. Assuming uniform quantization, determine the number of bits required per sample.	4	4