BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/2024)

CLASS: BTECH **SEMESTER : V**
BRANCH: ECE **SESSION : MO/2024**

SUBJECT: EC301 DIGITAL COMMUNICATION

TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	Compare PCM, DPCM, DM and ADM	[2]	3	2
Q.1(b)	Derive an expression to evaluate mean square Quantization error. Explain Companding	[2+1]	1	2,3
Q.2(a)	Evaluate Nyquist sampling rate for X(t) = Sinc (500t) + Sinc (200t).	[2]	1	2
Q.2(b)	Show graphical presentation of sampled signal quantized at level 3,1,7 using unipolar and bipolar, RZ , NRZ and Manchester encoding schemes.	[3]	1	3
Q.3(a)	Which type of optimum filter is called a Matched filter. Evaluate the impulse response for the same.	[2]	1	2
Q.3(b)	Derive an expression to evaluate signal to noise ratio as figure of merit for a Banse band binary signal receiver	[3]	1	3
Q.4(a)	Prove that the performance of Matched filter receiver and correlation receiver are identical.	[2]	1	3
Q.4(b)	With the help of suitable block diagram explain working of Adaptative Delta Modulation.	[3]	2	2
Q.5(a)	A 4 KHz sinusoidal message signal having amplitude 4V is fed to a delta modulator (DM) operating at sampling rate of 32 KHz. Calculate The minimum step size required to avoid slope overload noise.	[2]	1	3
Q.5(b)	With the help of suitable block diagram explain Phase Shift Keying Modulation-Demodulation system	[3]	3	2

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