BHARATI VIDYAPEETH'S COLLEGE OF ENGINEERING

(Approved by AICTE, New Delhi & Affiliated to Guru Gobind Singh Indraprastha University, Delhi)

(An ISO 9001:2015 Certified Institution)

A-4, Paschim Vihar, Main Rohtak Road, New Delhi – 110 063

Department of Electronics and Communication Engineering

Student Name_____ **Enroll. No**_____

Semester: V sem **Date:** _____

Course Code. : ETEC303 **Course Title: Digital Communication**

Quiz/Test No.: 01 **Marks Obtained**_____

Max. Marks : 01 **Evaluator's Sign**_____

Note: All questions are mandatory. All calculations to be done overleaf.

Q1. What should be the minimum sampling rate for the below mentioned signal $x(t)$ for complete recovery of original signal to be ideally possible? [0.1 mark]

$$x(t) = sin(300\pi t) + cos(900\pi t)$$

a) 450 Hz b) 150 Hz c) 600 Hz d) 900 Hz

Q2. What should be the Nyquist rate for the following signal? [0.1 marks]

$$x(t) = 12\pi\, cos(5000\pi t) cos\,(3000\pi t)$$

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Q3. What would be the SNR (in dB) for 8-bit PCM system with sinusoidal input? [0.1 mark]

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Q4. An n-bit PCM system has an input that varies between –2V to 4V and has power 2W. The communication established using this system is said to be effective only when the signal power is at least 1000 times larger in comparison to the noise power. Hence, for effective communication, find the minimum value of n.

_____ [0.4 marks]

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Q5. If a signal is being sampled at 25kHz and then applied to an 8-PCM system, calculate the following.

a) Baud Rate: _____ [0.1 marks]

b) Bit Rate: _____ [0.1 marks]

c) Required Minimum bandwidth: _____ [0.1 marks]