Enrolment No:	UPES UNIVERSITY WITH A PURPOSE

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, May 2021

Course: Analog and Digital Communication **Semester: IV**
Program: B. Tech ECE **Time 03 hrs.**
Course Code: ECEG 2033 **Max. Marks: 100**

Section A

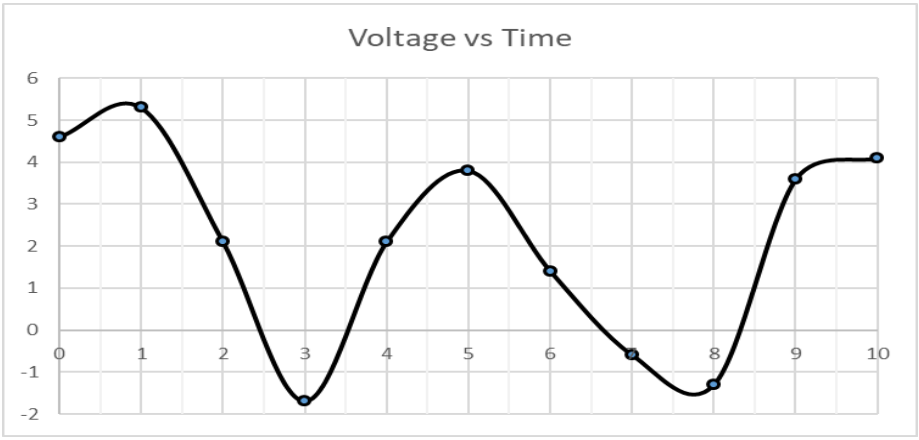
Each Question will carry 5 Marks

S. No.		CO
Q 1	The five commonly used PSK modulation techniques are ……., ……., ……., …….. & …….	**CO4**
Q 2	The steps involving the reception of a modulated wave in digital communication are ……., ……..., ……., …… & ……	**CO3**
Q 3	Determine the speed of a TDM line consisting of 20 DS0 line and 5 synchronization bits.	**CO3**
Q 4	Write down the frequency of carrier signal, color signal and sound signal of DD1 TV signal, whose broadcasting range is 41 MHz to 48 MHz.	**CO2**
Q 5	Name all the different types of Analog modulation technique with one application of each of them.	**CO1**
Q 6	The bandwidth of SHF, EHF, MF, VHF and IR band are…….	**CO1**

Section B

Each question will carry 10 marks
Instruction: Write short / brief notes

Q 1	Deduce the formula for finding the **total power** of AM wave. When a broadcast AM transmitter is modulated by 20%, its power is 10 kW. What will be the power when the modulation index is increased to 50%.	**CO4**
Q 2	Draw the eye diagram, phasor diagram and waveform of QPSK. The input bit sequence is 00101101.	**CO4**

Q 3	A signal containing two frequencies of 8 kHz and 2 kHz is converted into binary digits using PCM with the help of a quantiser. The step size of the quantiser is 0.2 volt, while the range of the quantiser is from 0.25 volt to 1.32 volt. The output bit stream is fed to a QPSK modulator. What would be the bandwidth required by the channel to transmit the signal smoothly?	**CO3**
Q 4	Write down the condition of error probability for both binary sequences. Find the probability of error of binary phase shift keying modulation scheme using white noise and matched filter analysis.	**CO3**
Q 5	Convert the following signal into AMI line coding. The quantization step size is 1volt. The circular spots are the sampling points. 	**CO4**
Section C **Each Question carries 20 Marks.** **Instruction: Write long answer.**		
Q 1	Design a MODEM using Binary Frequency Shift Keying Modulation or Binary Phase Shift Keying Modulation scheme. If the incoming data rate to it is 50 kbps and the carrier frequency is 500 kHz, then write down the frequency at each path of the modem.	**CO2**