Name: **Enrolment No:**	UPES

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2019

Course: Electronic Communication (ECEG3012) **Semester: V**
Programme: B. Tech ELE
Time: 03 hrs. **Max. Marks: 100**
Instructions: **Attempt all questions.**
Diagrams must be neat and clean

SECTION A

S. No.		Marks	CO
Q 1	Draw Manchester, AMI and both **scrambling** line coding for the bit sequence of **1000000110001**.	**5**	**CO4**
Q 2	Why Non S**ynchronous demodulation** is used in Frequency **shift keying** technique, whereas S**ynchronous demodulation** is used in Phase **shift keying** technique.	**5**	**CO3**
Q 3	Comment on the statement that FM is superior to AM, though there are varity of AM techniques.	**5**	**CO1**
Q 4	Why the video (picture) of the **Television** signals are transmitted using **VSB** technique and not by FM?	**5**	**CO2**

SECTION B

Q 5	Design a MODEM using **binary frequency shift keying modulation technique**. The carrier frequency of this MODEM is 500 MHz and the bit rate is 1000 kbps. Write the notation of frequency at each point.	**10**	**CO4**
Q 6	Deduce the formula for finding the **efficiency** of a **double side band amplitude modulated** signal. Calculate **efficiency** and **total** transmitted power of broadcast AM transmitter, which is modulated to 60% of modulation index. The carrier power of the transmitter is 15 kW. How much the efficiency is improved if the modulation index has been increased to 80%	**10**	**CO2**

Q 7	Define **Nyquist** criteria of **sampling**. Calculate the sampling frequency and quantization level of signal **m(t) = 5 Cos ^{2}3140t**. The **step** size is **2 volt**.	**10**	**CO3**
Q 8	Draw the **spectrum** of **DSB AM system and calculate the bandwidth.** **The carrier signal c(t) = and the message signal m(t) =** 10 Sin 2π×500t	**10**	**CO1**
SECTION-C			
Q 9	Code the following set of message by using both of **Shannon-Fano Coding** and **of Huffmann Coding**. . [M] = M_1 M_2 M_3 M_4 M_5 M_6 M_7 M_8 M_9 [P] = 0.20 0.15 0.15 0.10 0.10 0.09 0.09 0.10 0.02	**20**	**CO3**
Q 10	An analog message signal is represented as: **m(t) = Cos 5000πt + Cos 1500πt** is **sampled** using a suitable pulse train. What will be the pulse timing for ideal sampling? The signal is then quantized and converted into stream of 0 and 1. If the number of quantization level is **decreased** from to 256 to 64 in PCM, then by how much the **rate** of transmission and **SQR** will be changed? How the rate of transmission will alter if instead of PCM, we use DM technique.	**20**	**CO4**