

Name:	
Enrolment No:	

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES
End Semester Examination, December 2018

Course: Electronic Communication (ELEG 308)	Semester: VI
Programme: B. Tech ELE & PSE	Max. Marks: 100
Time: 03 hrs.	
Instructions: Attempt all questions. Diagrams must be neat and clean	

SECTION A

S. No.		Marks	CO
Q 1	Compare the two widely used analog communication modulation techniques and comment on the better of the two.	5	CO1
Q 2	Draw Manchester, AMI and B8Z6 line coding of 110001100000001 . Where these line coding are used?	5	CO3
Q 3	Why audio signal in the Television is transmitted using Frequency Modulation, but not the picture signal ?	5	CO2
Q 4	Why non-synchronous demodulation is used in Frequency shift keying technique, but not in Phase shift keying?	5	CO4

SECTION B

Q 5	Deduce the formula for finding the total power of AM wave . When a broadcast AM transmitter is modulated to 25% of modulation index, its transmitted power is come out to be 15 KW. What will be the transmitted power when the modulation index has been increased to 50%?	10	CO2
Q 6	Design a MODEM using binary digital phase modulation technique . The carrier frequency of this MODEM is 100 MHz and the bit rate is 50 kbps. Write the notation of frequency at each point.	10	CO4
Q 7	What are the criteria of choosing the suitable digital modulation technique? Compare BFSK and BPSK on these criteria and justify your choice.	10	CO1
Q 8	Discuss the drawbacks of Delta Modulation technique. Calculate the sampling frequency of a delta modulation of a message signal given as: $m(t) = 8 \cos 31400t$.		CO3

	The step size of the modulator is is 0.03 volt.		
SECTION-C			
Q 9	A signal attains a transmission rate of 2050 kbps after passing through PCM system. It is fed into a modulator, by passing through RZ unipolar line coder, whose carrier frequency is 20 MHz. How much bandwidth is required for transmitting using binary phase shift keying modulation and quaternary phase shift keying modulation technique? Draw the spectrum of the two cases also. What will happen to the bandwidth if instead of PCM, we use DM technique?	20	CO4
Q 10	Code the following set of message using Shannon-Fano Coding and Huffmann Coding . Write down the observation. <p style="margin-left: 40px;">[M] = M₁ M₂ M₃ M₄ M₅ M₆ M₇ M₈ [P] = 0.25 0.15 0.12 0.14 0.10 0.09 0.05 0.10</p>	20	CO3

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SECTION A

S. No.		Marks	CO
Q 1	Draw both types of Bipolar line coding and any of the scrambling coding for the bit sequence of 1000000110001 . State their usefulness.	5	CO4
Q 2	Why synchronous demodulation is utilized in Phase shift keying technique, but not in Frequency shift keying?	5	CO3
Q 3	Comment on the advantages and disadvantages of Amplitude Modulation and Frequency Modulation . State their application also.	5	CO1
Q 4	Why Television signals are transmitted using VSB technique and not by SSB ?	5	CO2

SECTION B

Q 5	Design a MODEM using binary frequency shift keying modulation technique . The carrier frequency of this MODEM is 50 MHz and the bit rate is 100 kbps. Write the notation of frequency at each point.	10	CO4
Q 6	Deduce the formula for finding the efficiency of a full carrier double side band amplitude modulated signal. Calculate efficiency and total transmitted power of broadcast AM transmitter, which is modulated to 50% of modulation index. The carrier power of of the transmitter is 8 kW.	10	CO2
Q 7	Define Nyquist criteria of sampling . Calculate the sampling frequency and quantization level of signal $m(t) = 8 \text{ Cos } 2\pi 1400t$. The step size is 3 volt.	10	CO3
Q 8	Draw the spectrum of Binary Phase Shift Keying and Binary Frequency Shift Keying and calculate their bandwidth . The carrier frequency is 10 MHz and the bit rate is 50kbps.	10	CO1

SECTION-C

Q 9	<p>Code the following set of message and probability using Shannon-Fano Coding and Huffmann Coding. Write down the observation.</p> <p style="text-align: center;"> [M] = M₁ M₂ M₃ M₄ M₅ M₆ M₇ M₈ [P] = 0.15 0.2 0.06 0.11 0.15 0.09 0.14 0.10 </p>	20	CO3
Q 10	<p>An analog message signal is represented as: $m(t) = \text{Cos } 5000\pi t + \text{Cos } 1500\pi t$ is sampled using a suitable pulse train. What will be the separation, in time, between two consecutive sampled pulse trains? The signal is then quantized and converted into stream of 1 and 0. If the number of quantization level is decreased from to 256 to 128 in PCM, then how much the rate of transmission and SQR will be changed? How the rate of transmission will alter if DM technique is used.</p>	20	CO4