

## T.E Sem V - OLD - Electrical - CE

Q.P. Code : 3738

**(OLD COURSE)**

(3 Hours)

[ Total Marks : 100

**N.B. :** (1) Question No. 1 is **compulsory**.(2) Attempt any **four** questions out of the remaining **six** questions.

(3) Make suitable assumptions if required and justify the same.

1. (a) Draw PCM Transmitter and Receiver. 20  
 (b) Draw BPSK waveform for data bit sequence 10111010  
 (c) Explain and prove any two properties of fourier transform  
 (d) Explain need for modulation for long distance transimission.
2. (a) Draw and explain BPSK transmitter and receiver with the help of neat waveforms 10  
 (b) The convolution encoder has the follwing two generator sequences each of 10  
 lengths.  
 $(g_0^1, g_1^1, g_2^1) = (1, 1, 1)$  and  $(g_0^2, g_1^2, g_2^2) = (1, 0, 1)$   
 Draw code tree, code trellis and state diagram for message = 10011.
3. (a) Write short notes on Telemetry. 10  
 (b) An AM carrier is modulated with an audio signal given by 10  
 $m(t) = 0.2 \sin [w_1(t) + 0.5 \cos w_2(t)]$  where  $f_1 = 500\text{Hz}$   
 and  $f_2 = 1000 \text{ Hz}$  . The peak amplitude of the carrier signal  $A_c = 10$  volts and  
 the carrier frequency  $f_c = 50 \text{ KH}_2$   
 Assume that the AM signal is feed into a  $50 \Omega$  loud.  
 (i) Evaluate and sketch the spectrum of AM wave  
 (ii) Calculate the modulation index.  
 (iii) Find the average power of the AM wave.  
 (iv) Find the power carrier by the side bands.
4. (a) Explain Delta modulation 10  
 (b) Compute the Huffman code for this source moving the "combined" symbol 10  
 as high as possible and compute efficiency.

Symbol	$S_0$	$S_1$	$S_2$	$S_3$	$S_4$	$S_5$	$S_6$
Probability	0.25	0.25	0.125	0.125	0.125	0.0625	0.0625

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5. (a) Explain superhetrodyne receivers 10  
(b) Write short notes 10  
(i) Quatigation process  
(ii) AGC Method
6. (a) What is methods to suppress the unwanted sideband, explain in brief any one method. 10  
(b) A message 101101 is to be transmitted in cyclic code with a generator 10  
polynomial  $G(D) = D^4 + D^3 + 1$ . Obtain the transmitted code word. How many  
check bits does the encoded message contain ? Draw the encoding arrangement  
for the same.
7. (a) Write short notes on : 20  
(i) Image frequency and its rejection  
(ii) ISB receiver  
(iii) Quatigation process
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