10×2=20

code for a discrete source of
ols A, B, C, D and E with
.3, 0.08 and 0.02 respectively
code word length is minimum.

symbols generated by a source
of occurrence as given below

S5	S6	S7	S8	S9
0.08	0.06	0.06	0.07	0.05

words of the symbols using
technique. Also determine the
th.

ntropy. Find an expression for
a continuous channel.

[6375]

Printed Pages : 4

EEC-609

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 121601

Roll No.

B. Tech.

(SEM. VI) THEORY EXAMINATION, 2014-15

ADC

Time : 3 Hours] [Total Marks : 100

Note : Answer all the questions.

1 Answer any four parts : 5×4=20

(a) Explain the working of Phase shift method for SSB-SC generation with block diagram. Draw the spectrum of SSB-SC.

(b) Derive an expression for effective modulation index of a multi tone modulated A.M.

(c) The equation of an A.M. wave is $x(t) = 100 [1 + .2\cos(6280t)] \cos(2\pi \times 10^6 t)$ find all the frequency present.

(d) Define vestigial side band modulation. Describe the working of frequency discrimination method for VSB generation and calculate the bandwidth of VSB modulation.

(e) Describe briefly the operation of super heterodyne receiver with proper block diagram. What is drawback of tuned radio frequency receiver?

121601] 1 [Contd...

2 Answer any four parts : 5×4=20

(a) A single tone FM is represented by the voltage equation as $v(t) = 25\cos[\ 9\times10^7\ t + 5\sin1650\ t]$. Find the following :

(i) Carrier frequency

(ii) Modulating Frequency

(iii) Modulation index

(iv) Maximum deviation

(b) What is the difference between direct and indirect methods of FM generation? Explain the working of varactor diode method for FM generation.

(c) Define signal to noise ratio and noise figure of a receiver. Derive a relation between noise figure and equivalent noise temperature.

(d) Two resistors 20 k ohm and 50 k ohm are at room temperature. Calculate the thermal noise voltage, for bandwidth of 100 kHz.

(i) For two resistors in series.

(ii) For two resistors in parallel.

(e) Write comparison between A.M. and F.M. and derive the equation for F.M.wave.

3 Answer any two parts : 10×2=20

(a) In what way a pulse code modulation in different from other modulation system. What makes it a digital system? What are the advantages and application of PCM?

(b) Describe delta madulation systems. What are its limitations? How can they be overcome? Compare it with differential PCM.

(c) Write short notes on-

(i) Granularity & slope-overload error in delta modulation.

(ii) Non uniform quantization and its applications.

(d) A Television signal having a bandwidth of 4.2 MHz is transmitted using binary PCM system. Given that the number of quantization levels is 512. Determine:

(i) Code ward length.

(ii) Transmission Bandwidth

(iii) Final bit rate

(iv) Output S/N ratio.

4 Answer any two parts : 10×2=20

(a) Explain the working of the coherent ASK receiver and obtain the expression for probability of error,

(b) Draw the block diagram of Transmitter and Receiver of BPSK. Explain its working-and also calculate probability of error.

(c) Why FSK is preferred over ASK? Give reason, How FSK is generated and obtain the expression for its bandwidth. Briefly discuss regarding its frequency spectrum.

5 Answer any two parts : 10×2=20

(a) Design binary Huffman code for a discrete source of five independent symbols A, B, C, D and E with probabilities 0.4, 0.2, 0.3, 0.08 and 0.02 respectively such that the variance of code word length is minimum.

(b) Consider a sequence of symbols generated by a source with their probabilities of occurrence as given below

Symbol	S 1	S2	S3	S4	S5	S6	S7	S8	S9
Probability	0.22	0.19	0.15	0.12	0.08	0.06	0.06	0.07	0.05

Determine the code words of the symbols using Shannon- Fano coding technique. Also determine the average code word length.

(c) Define information and entropy. Find an expression for the channel capacity of a continuous channel.

Printed Pages : 4

(Following Paper ID and Roll No. to

PAPER ID : 121601

Roll No.

B. Te

(SEM. VI) THEORY EX

ADC

Time : **3** Hours]

Note : Answer all the questions.

1 Answer any four parts :

(a) Explain the working o SC generation with blo of SSB-SC.

(b) Derive an expression fo a multi tone modulated

(c) The equation of an A. x (t) =100 [1+.2cos (62 frequency present.

(d) Define vestigial side band of frequency discrimina and calculate the bandwi

(e) Describe briefly the o receiver with proper bl of tuned radio frequen