

10×2=20

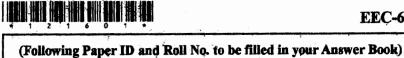
code for a discrete source of ols A, B, C, D and E with 3, 0.08 and 0.02 respectively code word length is minimum. symbols generated by a source of occurrence as given below

S6 S7 S8 S9 0.08 0.06 0.06 0.07 0.05

ords of the symbols using echnique. Also determine the th.

ntropy. Find an expression for a continuous channel.

Printed Pages: 4



PAPER ID: 121601

EEC-609

Roll No.

(SEM. VI) THEORY EXAMINATION, 2014-15 ADC

B. Tech.

Time: 3 Hours]

[Total Marks: 100

Note: Answer all the questions.

Answer any four parts:

5×4=20

- Explain the working of Phase shift method for SSB-SC generation with block diagram. Draw the spectrum of SSB-SC.
- Derive an expression for effective modulation index of (b) a multi tone modulated A.M.
- (c) The equation of an A.M. wave is $x(t) = 100 [1 + 2\cos(6280t)] \cos(2\pi x \cdot 10^{6}t)$ find all the frequency present.
- Define vestigial side band modulation. Describe the working (d) of frequency discrimination method for VSB generation and calculate the bandwidth of VSB modulation.
- Describe briefly the operation of super heterodyne (e) receiver with proper block diagram. What is drawback of tuned radio frequency receiver?

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Answer any four parts: A single tone FM is represented by the voltage equation

as $v(t) = 25\cos[9x10^7 t + 5\sin 1650 t]$. Find the following:

Carrier frequency

E Modulating Frequency Modulation index

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

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

<u>e</u> Two resistors 20 k ohm and 50 k ohm are at room bandwidth of 100 kHz. temperature. Calculate the thermal noise voltage, for

For two resistors in series.

For two resistors in parallel

<u>@</u> Write comparison between A.M. and F.M. and derive

the equation for F.M.wave.

Answer any two parts:

w

2 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

10×2=20

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PCM?

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

5×4=20

<u>ල</u> Write short notes on-

Granularity & slope-overload error in delta

Non uniform quantization and its applications. modulation.

 Ξ

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

Code ward length

Transmission Bandwidth

Final bit rate

1

Output S/N ratio.

Answer any two parts:

10×2=20

B

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

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

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

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5 Answer any two parts:

 $10 \times 2 = 20$

- (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 S2 **S**5 **S7 S6** 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

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(SEM. VI) THEORY EX

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