



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

PAPER ID : 132601

Roll No.

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B. Tech.

(SEM. VI) THEORY EXAMINATION, 2014-15
COMMUNICATION ENGINEERING

Time : 3 Hours]

[Total Marks : 100

Note : Attempt All Questions. All Questions carry equal marks.

1. Attempt any four parts of the following : (5x4)
 - (a) With the help of block diagram explain the working of communication system.
 - (b) Explain how DSB-SC demodulator works.
 - (c) What is the need multiplexing? Explain the working of FDM.
 - (d) Explain the square law diode modulation method for AM generation.
 - (e) Determine the percentage of power saving when carrier wave and one of side bands are suppressed in a AM wave modulated to depth of
 - (i) 100% (ii) 50%
 - (f) Explain the VSB transmission.

2. Attempt any four parts of the following : (5x4)
- (a) Explain the difference b/w narrow band FM & wide band FM.
 - (b) Illustrate the principle of Armstrong method of generating FM.
 - (c) Derive the expression for single tone narrow band frequency modulated wave.
 - (d) Consider an angle modulated signal:
 $x(t) = 3\cos [2\pi \times 10^6 t + 2 \sin (2\pi \times 10^3 t)]$.
Find
 - (i) Its instantaneous frequency at time $t = 0.5$ ms
 - (ii) Maximum frequency and maximum phase deviation.
 - (iii) BW and Transmitted Power.
 - (e) Write a short note on super heterodyne receiver.
 - (f) Relate phase and frequency modulation.
3. Attempt any two parts of the following : (10x2)
- (a) State and prove the Sampling Theorem. Draw the block diagram of pulse width modulation and explain its working.
 - (b) Explain spike generation and threshold effect in FM. How to improve performance of FM receiver over these effects.
 - (c) Explain the noise analysis of DSB-SC receiver using coherent detection & derive the expression for figure of merit.
4. Attempt any two parts of the following : (10x2)
- (a) Explain the cause of Inter symbol interference & discuss the Nyquist criterion for a distortionless base band binary transmission.

- (b) A voice frequency signal band limited to 3 kHz is transmitted with the use of DM (Delta modulation) system. The pulse repetition frequency is 30,000 pulses per second, and the step size is 40mV. Determine the maximum permissible speech signal amplitude to avoid a slope overload error. What is granular Noise in DM.
- (c) Explain the characteristic of Matched filter and calculate the impulse response of Matched filter.
5. Attempt any two parts of the following : (10x2)
- (a) Compare the noise performances of various PSK & FSK system.
- (b) Define the following terms :
- (i) Information and Entropy
- (ii) A discrete memoryless source has an alphabet of seven symbols whose probabilities of occurrence are as describe here :
- | | | | | | | | |
|-----------------|-------|------|-----|------|------|-----|------|
| {Symbol} | [s0 | s1 | s2 | s3 | s4 | s5 | s6] |
| {Probabilities} | [0.05 | 0.15 | 0.2 | 0.05 | 0.15 | 0.3 | 0.1] |
- Compute the Huffman code for this source, moving “combined” symbol as high as possible.
- (c) Write short notes on the following:
- (i) Digitization of Video
- (ii) OFDM.
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