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RN-8197

B. E. - II (Sem. IV) (EL/CO/IT/TT/TP)

Examination

May / June - 2010

Communication Engineering

(Institute Elective - 1)

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दर्शाविए निशान्चिवाणी विगतो उत्तरवडी पर अवश्य लखवी.
Fillup strictly the details of signs on your answer book.

Name of the Examination :
B. E. 2 (Sem. 4) (EL/CO/IT/TT/TP)

Name of the Subject :
Communication Engineering

Subject Code No. : **8 1 9 7** Section No. (1, 2,.....): **1&2**

Seat No. :

Student's Signature

- (2) Attempt all questions.
- (3) Figures to the **right** indicate **full** marks.
- (4) Assume suitable data wherever required.
- (5) Draw neat and clean diagram whenever required.

SECTION - I

- 1 (a) Answer the following questions in short : 10
 - (1) Explain the term modulation. State the necessity of it.
 - (2) What is Thermal agitation noise ? On what factors does it depend on ?
 - (3) Draw the block diagram of basic radio transmitter.
 - (4) What is meant by modulation index ? State three modulation indices with respect to AM.
 - (5) In an FM system, if M_f (modulation index) is doubled by halving the modulating frequency, what will be the effect on the maximum deviation ?
- (b) What is noise ? State its different types. Explain any two in detail. 7
- (c) Compare Double side-band and Single side-band form of amplitude modulation. 3

- 2 (a) Prove that the balance modulator produces an output consisting of sidebands only, with the carrier removed. 8
- (b) In an FM system, when an audio frequency is 500 Hz and the AF voltage is 2.4 V, the deviation is 4.8 kHz. If the AF voltage is now changed to 7.2 V, what is the new deviation ? If the AF voltage is raised to 10 V while the AF is dropped to 200 Hz, what is the deviation ? Find the modulation index in each case ? 7

OR

- 2 (a) Explain any one method for the generation of frequency modulation. 8
- (b) Calculate the percentage power saving when the carrier and one of the sidebands are suppressed in an AM wave modulated to a depth of (a) 100%, (b) 50% and (c) 30%. 7
- 3 Attempt any **three** : 15
- (1) Write a short note on RF section and characteristics of AM receivers.
- (2) Describe the general process of frequency changing in as super heterodyne receiver. What are some of the devices that can be used as frequency changes ?
- (3) What is frequency synthesis ? What are the situations in which it is advantageous to use a frequency synthesizer ?
- (4) Compare and contrast all three analog modulation schemes.
- (5) Describe frequency and phase modulation giving mathematical analogies for each.

SECTION – II

- 4 (a) Fill in the blanks : 10
- (1) In _____ system receiver can request for retransmission of message.
- (2) _____ is used for teleprinter.
- (3) Non uniform quantization is preferred for _____.
- (4) The PAM is type of _____ modulation.
- (5) The Nyquist rate for signal $x(t)=\cos(2\pi *500t)$ is _____.

- (6) If the peak to peak signal amplitude is 1 V and number of quantization level is 100 then the step size in PCM system is _____.
- (7) Geostationary satellites are at _____ above earth's surface.
- (8) The uplink frequency is _____ than downlink frequency in satellite.
- (9) Luminance represents the _____ of the signal.
- (10) In optical fiber system _____ is used as a light source.
- (b) Define and describe pulse position modulation. 5
Explain with waveforms how it is derived from PWM.
- (c) How does the parity checking technique help in detecting the presence of error in data communication? 5
State its limitation. It is possible to correct errors using parity check? Justify your answer.
- 5 (a) What do you mean by compatibility? Explain the various conditions for compatibility. Draw and explain colour camera tube and matrix arrangement. 6
- (b) Explain power budget in optical fiber system. 5
- (c) Calculate the critical angle of incidence between two substances with different refractive indices where $n_1=1.5$ and $n_2=1.46$. 4
- OR**
- 5 (a) Draw and explain NTSC encoder block diagram. 6
- (b) Explain various losses occurred in optical communication system. 5
- (c) Calculate the capacity of standard 4 kHz telephone channel with a 32 dB signal to noise ratio. 4
- 6 Answer the following : (attempt any **three**) 15
- (a) Define acceptance angle and acceptance cone? What is the importance of acceptance cone? State Snell's law and express the critical angle equation.
- (b) Write short note on interlace scanning with proper diagram.

- (c) What do you mean by multiplexing ? Explain FDM with its group formation.
 - (d) Enlist the characteristics of data transmission circuits, and explain echo suppressors in detail.
 - (e) What do you mean by quantizing ? Explain quantization noise with the help of PCM system.
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