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RN-6769

B. E. - III (Sem. V) (CO) Examination

May / June - 2010

Communication Systems

Time : Hours] [Total Marks :

Instructions :

(1)

નીચે દર્શાવેલ ☛ નિશાનીવાળી વિગતો ઉત્તરવહી પર અવશ્ય લખવી.
Fillup strictly the details of ☛ signs on your answer book.

Name of the Examination :

☛ **B. E. - 3 (Sem. 5) (CO)**

Name of the Subject :

☛ **Communication Systems**

☛Subject Code No. : **6 7 6 9** ☛Section No. (1, 2,.....) : **1&2**

Seat No. :

Student's Signature

(2) Assume suitable data wherever necessary.
(3) The acronyms carry their usual meaning.
(4) Figures to the right indicate **full** marks.
(5) Use of scientific calculator CASIO FX-82/83, FX-100 or equivalent of other companies is allowed.

SECTION - I

Q.1 A	Answer The following questions.	5
1	Define the modulation index of AM wave	
2	State the frequency for MW radio receiver.	
3	What is a typical value for frequency deviation for wideband FM?	
4	Give the name of distortions occur in a typical diode detector circuits.	
5	For audio transmission, out of AM and FM which one is better? Why?	
(B)	Explain the terms: sensitivity, selectivity	2
(C)	Calculate the percentage power saving when carrier and one of the sidebands are suppressed in an AM wave modulated to a depth of 100% and 50%.	3
(D)	Explain how the modulation index of an AM wave can be measured on CRO with the help of trapezoidal pattern.	5
(E)	What do you mean by image frequency and its rejection?	5
Q.2 (A)	Describe and compare the three methods of generation of SSB-SC modulation.	8
(B)	The antenna current of an AM transmitter is 10amo when it is modulated to a depth of 30% by an audio signal.It increases to 11 amp. When another signal modulates the carrier.What is the modulation index due to second wave?	7
	OR	

Q.2 (A)	Compare : 1.Frequency modulation and phase modulation 2.Wideband and Narrow band FM	8
(B)	In FM system, the modulating frequency fm=1 khz, the modulating voltage Em=2 volt and the deviation is 6 khz.If the modulating voltage is raised to 4 volt than what is the new deviation? If the modulating voltage is futther increased to 8 volt and modulating frequency is reduced to 500hz what will be deviation?	7
Q.3.	Write a Short note (Any Three)	15
1	Varactor diode modulator.	
2	ratio detector	
3	Comparison of different techniques of FM demodulator	
4	VSB transmission.	
5	Lattice type balanced modulator	

SECTION - II

Q 4 (A)	**Answer the Following Questions**	**10**
1.	What is the sampling rate would be appropriate for each of the following 1. A telephone channel limited to 4KHz bandwidth 2. A television video channel with a maximum bandwidth of 4.5MhHz	**2**
2	What is Ground Wave?	**2**
3	What are the different type of satellite orbit and angle of inclination?	**2**
4	Give the formula for NA?	**2**
5	What is Quantization?	**2**
(B)	In a VHF mobile radio system, the base station transmit 100W at 150MHz, and the antenna is 20m above ground. The transmitting antenna is 0.5λ dipole for which the gain is 1.64. Calculate the field strength at a receiving antenna of height 2m at distance of 40 Km.	**6**
(C)	Give the advantage and disadvantage of Fiber optics communication over wire lines.	**4**
Q.5 (A)	Explain the Pulse Code Modulation System with appropriate Block diagram,	**7**
(B)	In context to tropospheric propagation deduce the expression $E_R = E_0 4\Pi h_T h_R / \lambda d^2$	**8**
	OR	
Q.5 (A)	Explain the Pulse width Transmission system with appropriate block diagram.	**7**
(B)	Explain the Working and construction for PIN diode for fiber optics Communication	**8**
Q.6	**Answer The Following Questions (Any Three)**	**15**
1.	Explain Attenuation in Atmosphere.	
2.	Explain FSK Transmission system.	
3.	Derive an expression to show that a satellite launched into a circular orbit at the height (H) m from the surface of earth will move with a velocity V given by, $V = R\sqrt{\frac{9}{R+H}}$	
4.	Calculate (C/N_0) at the earth receiving station, from a satellite transmitting an erip of 49.5 dBW on a frequency of 12GHz. The earth station antenna angle of elevation is 7^0 , and the receiving figure of merit is 40.7 dB.	
5.	Explain Secant law and maximum usable frequency.	