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SE-6803

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

April / May – 2011

Communication Engineering

Time : **3** Hours] [Total Marks : **100**

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)**

Name of the Subject :

☛ **Communication Engineering**

☛ Subject Code No. : **6 8 0 3** ☛ 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

1 (a) Answer the following questions : **5**

(1) Define the modulation index of AM wave.

(2) State the type of analog modulation systems.

(3) What is frequency modulation index ?

(4) What is the demodulation method for DCB-SC signal ?

(5) For audio transmission, out of AM and FM which one is better ? Why ?

(b) Explain the terms : sensitivity, selectivity **4**

(c) Explain how the modulation index of an AM wave can be measured on CRO with the help of trapezoidal pattern. **6**

(d) What do you mean by image frequency and its rejection ? **5**

2 (a) Describe and compare the three methods of generation of SSB-SC modulation. **8**

(b) A 400 Watt carrier is modulated to a depth of 75 percent. Find the total power in the amplitude-modulated wave. Assume the modulating signal to be a sinusoidal one. **7**

OR

2 (a) Compare : **8**

(1) Frequency modulation and Phase modulation

(2) Wideband and Narrow band FM

(b) A carrier is frequency modulated by a sinusoidal modulating signal x(t) of frequency 2 kHz, it result in a frequency deviation of $\triangle$f of 5 kHz. Find the bandwidth occupied by the FM waveform. The amplitude of the modulating sinusoid is increased by a factor of 3 and its frequency lowered by 1 kHz. Find the new bandwidth. **7**

3 Write short notes : (any **three**) **15**

(a) Varactor diode modulator

(b) Ratio detector

(c) Comparison of different techniques of FM demodulator

(d) Compare FM and PM

(e) Lattice type balanced modulator.

SECTION - II

Instructions : (1) Attempt all the questions.

(2) Figures to the right indicate marks.

(3) All symbols and abbreviations have their usual meaning.

(4) Assume suitable data, wherever required.

4 (a) Do as directed : (two marks each) **10**

(1) State sampling theorem.

(2) Draw PWM waveform for one complete cycle for baseband analog signal.

(3) Advantages of optical fibers over other wire transmission lines.

(4) Define following terms with respect to the satellite system :
(1) Apogee and Perigee, (2) Ascending node.

(5) If the peak transmitted power in radar system is increased by a factor of 15 and maximum range will be increased by a factor of _____ . Show calculation.

(b) Define PAM and explain with the help of necessary equations and diagrams. Also draw and explain its spectrum. **5**

(c) Explain TDM-PCM system with block diagram. **5**

5 (a) Draw and explain DPCM transmitter and reciver. **7**

(b) Derive the equation for uplink carrier to noise density ratio in decibel for satellite system. **7**

OR

5 (a) Explain station keeping of satellite and why these maneuvers are necessary for geostationary orbit. **7**

(b) Explain various types of photo detectors used in fiber optic communication. **7**

6 Attempt any **two** : **16**

(a) LED

(b) Composite video signal

(c) Basic concept of RADAR

(d) Rayleigh scattering and absorption losses in fiber.