



SE-6769

B. E. - III (Sem. V) (CO.) Examination
April / May - 2011
Communication Systems

Time : 3 Hours]

[Total Marks : 100

Instructions :

(1)

नीचे दशांशवैल निशानीवाणी विगतो उत्तरवडी पर अवश्य कभवी.
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,.....) : NIL

Seat No. :

Student's Signature

- (2) Attempt all questions.
(3) Make suitable assumptions wherever necessary.
(4) Figures to the right indicate full marks.

Q-1 (a) Give the answer.

(10)

1. What should be modulating signal amplitude E_m for 50% modulation with carrier $e_c = 20 \cos \omega_c t$?
2. The expression of BW of FM as per carson's rule is _____.
(a) $2(\delta + f_m)$ (b) $\delta + f_m$ (c) $\delta + 2f_m$
3. The number of signal sidebands in FM depends on _____.
(a) Modulation index (b) δ (c) f_c
4. State true or false:
FM is called as constant BW system.
5. The relation between i/p signal freq. f_s , Local oscillator Freq. f_o and IF is _____.
(a) $f_s = f_o - IF$ (b) $IF = f_s - f_o$ (c) $IF = f_o - f_s$
6. The frequency range of FM broadcast is _____.
(a) 3 to 300 MHz (b) 88 MHz to 108 MHz (c) above 100 MHz
7. For a carrier signal of 1 MHz and modulating signal of 2 KHz, what is the frequency range occupied by the AM?
8. The AGC is produced at the o/p of _____.
(a) Mixer (b) IF amplifier (c) Detector.
9. The quality of FM reception is _____ than compare to AM reception.
(a) Superior (b) Inferior (c) same
10. High selectivity means
(a) Wide bandwidth (b) Narrow bandwidth

- (b) Explain a different Power relation of AM signal component. (5)
- (c) Derive the mathematical expression of FM signal (5)
- Q-2 (a) Explain a working of Balanced Slope detector in FM receiver (7)
- (b) A carrier $V_c = 100\cos(2\pi 10^5 t)$ is amplitude modulated by a signal $V_m = 50\cos(2\pi 10^3 t)$ up to a modulation depth of 50%. Calculate the amplitude and frequency of each sideband and the rms voltage of modulated carrier. (8)
- OR**
- (a) Explain a different method of tracking in AM receiver (7)
- (b) In a FM system, the modulating voltage $E_m = 2$ V and deviation is 6 KHz. If the modulating voltage is raised to 4v then what is the new deviation? If the modulating voltage is further increased to 8v and modulating frequency is reduced to 500Hz what will be deviation? (8)
- Q-3 Write a Short note (any three) (15)
1. Comparison of Wideband and Narrowband receiver.
 2. Image frequency and its rejection
 3. Envelop detector
 4. Super heterodyne receiver
 5. Automatic Gain Control.
- 4 (a) (i) Explain what is meant by synchronization in connection with digital transmission. 10
- (ii) Define Kepler's first law.
- (iii) Define Numerical aperture of fiber.
- (iv) Explain μ -law.
- (v) Write down advantages of PCM.
- (b) (i) Draw and explain differential pulse code modulation transmitter. 6
- (ii) Draw PWM and PPM wave form for one complete cycle of Baseband analog signals.
- 5 (a) The context to radio wave propagation in free space deduce the expression 7
- $$\epsilon = \frac{\sqrt{30 P_T G_T}}{d}$$
- (b) Explain the concept of probability of bit-error in base band transmission with respect to unipolar and polar waveform. 8
- OR**
- 5 (a) Explain the five channel TDM PAM signal system. Also draw channeling scheme for Bell-T₁ PCM 24 channel system. 8
- (b) Explain modulator and demodulator of BPSK using block diagram. 7

- 6 (a) Explain unguided Fabray-Perot laser diode as an optical source. 8
(b) Explain satellite power system in detail. 7

OR

- (a) Discuss various losses in fiber optic communication. 8
(b) Discuss satellite transponder in detail. 7
