

B.E. / B.Tech (Full time) ARREAR EXAMINATIONS, NOV / DEC 2011
ELECTRONICS AND COMMUNICATION ENGINEERING BRANCH
FOURTH SEMESTER
(REGULATION 2008)

EC 9253 COMMUNICATION SYSTEMS

Time: 3 Hours

Max.marks: 100

PART-A (10X2=20 Marks)

1. The total antenna current of an AM transmitter is 5A. If modulation index is 0.6, calculate the carrier current in antenna.
2. A carrier is frequency modulated with a sinusoidal signal of 2 kHz resulting in a maximum frequency deviation of 5 kHz. Find the bandwidth of modulated signal.
3. What is meant by figure of merit?
4. Define fidelity and sensitivity of the radio receiver.
5. What is slope overload distortion and granular noise in delta modulation?
6. What is meant by Comanding?
7. Define power efficiency and spectral efficiency.
8. Distinguish coherent and non-coherent detector.
9. What is pre-emphasis and de-emphasis? Why it is required?
10. What is meant by capture effect?

PART-B (5X16=80 Marks)

- 11.(i) Calculate the percentage power saving, when a carrier and one of the sidebands are suppressed in AM wave modulated to the depth of (I) 100% and (II) 30%. (8)
- (ii) With neat circuit diagram, explain the operations of ratio detector. Compare the features of ratio detector and Foster-Seely detector. (8)
- 12.(a)(i) Derive the effective noise temperature when 'n' networks are connected in cascade. (8)
- (ii) An amplifier with $g_a = 40$ dB and $B_N = 20$ kHz is found to have $N_{a0} = 10^9$ KT_0 when $T_i = T_0$. Determine effective temperature T_e and noise figure. (8)
- OR**
- 12.(b)(i) With neat block diagram, explain the super heterodyne FM receiver. (8)
- (ii) With neat block diagram, explain the single tuned receivers. (8)
- 13.(a)(i) Explain the transmitter and receiver of the PCM (pulse code modulation). (8)
- (ii) Derive the expression for the signal to quantization noise power in PCM system. (8)
- OR**
- 13.(b)(i) With neat diagram, explain the adaptive delta modulation. (8)
- (ii) Describe the operations of time division multiplexing and compare its advantages and disadvantages over frequency division multiplexing. (8)

- 14.(a)(i) Explain the operations of QPSK transmitter and receiver. (8)
(ii) With neat constellation diagram, compare the features of QPSK and offset QPSK. (8)

OR

- 14.(b)(i) Explain the FSK transmitter and coherent FSK receiver. (8)
(ii) Derive an expression for the error probability of FSK signal. (8)

- 15.(a) Derive an expression for signal to noise ratio of DSB-SC signal. (16)

OR

- 15.(b) Derive an expression for signal to noise ratio at the output of FM receiver. (16)
