

B.E. DEGREE EXAMINATIONS: APRIL / MAY 2010

Fifth Semester

ELECTRONICS AND COMMUNICATION ENGINEERING

U07EC501: Communication Theory

Time: Three Hours**Maximum Marks: 100****Answer ALL the Questions:-****PART A (10 x 1 = 10 Marks)**

1. Advantages of SSB over DSB-FC

- (a) less bandwidth (b) Power saving
(c) reduced interference (d) all the above

2. High level modulation is

- (a) Complex (b) Simple (c) Moderate (d) Very simple

3. Which of the following system is called constant bandwidth system?

- (a) Reactance modulator using FET (b) Reactance modulator using BJT
(c) Ring modulator (d) varactor diode

4. The modulation of a wide band FM system is

- (a) >1 (b) <1 (c) $=1$ (d) $+1$

5. Double spotting mean

- (a) same station gets picked up at two different nearby points
(b) Two different station gets picked up at same points
(c) Same station at same points
(d) two different station at two different near by station

6. Zero crossing detector operation on the principal

- (a) $f_i \approx 1/2\Delta t$ (b) $f_i \approx 1/\Delta t$ (c) $f_i \approx 2/\Delta t$ (d) $f_i \approx 2/\Delta t^2$

7. The advantages of FM are

- (a) better noise immunity (b) capture effect
(c) high transmission efficiency (d) all

8. The artificial boosting of higher modulating frequency is called

- (a) Pre-emphasis (b) De-Emphasis (c) Capture effect (d) Threshold effect

9. Two probabilities that are not equal are called

- (a) Priori (b) Transition (c) Symmetric (d) conditional

10. Mutual Information is

- (a) $I[X, Y] = H(X) - H(X/Y)$ (b) $P[X, Y] = P(X) - H(X/Y)$
(c) 1 (d) 0

PART B (10 x 2 = 20 Marks)

11. What is the need for modulation?
12. Compare AM and FM .
13. Discuss the importance of RC time constant in envelop detector
14. What is compander?
15. What is the need for additive mixers?
16. What are the advantages of Ratio Detector?
17. Define de-emphasis.
18. List out the forms of noise to which a transistor is prone.
19. Write down the formula for mutual information.
20. Write the expression for code efficiency in terms of Entropy.

PART C (5 x 14 = 70 Marks)

21. (a) (i) Obtain the power relationship between AM modulated and unmodulated Carrier wave. (7)
- (ii) Explain how DSB-SC is generated with block diagram. (7)
- (OR)**
- (b) (i) Discuss the features of VSB. (7)
- (ii) Write notes on Frequency Division Multiplexing. (7)
22. (a) (i) Derive mathematical expression for FM modulated carrier. (7)
- (ii) Explain the spectrum and bandwidth requirements of FM wave based on Bessel function. (7)
- (OR)**
- (b) (i) Explain the function of reactance modulator for FM. (7)
- (ii) Explain the operation of indirect method of FM using Phase modulation. (7)
23. (a) (i) Discuss the importance of receiver characteristics. (7)
- (ii) With the aid of diagram explain the operation of Envelop detector. (7)

(OR)

- (b) (i) Showing the basic functional block explain the operation of Superhetrodyne Receiver. (8)
- (ii) How is constant IF achieved in the Superhetrodyne receiver. (6)

24. (a) (i) Compare the noise performance of AM and Fm. (7)
- (ii) Write a note on FM threshold Effect. (7)

(OR)

- (b) (i) Discuss the effect of noise in AM system using envelop detection. (7)
- (ii) Explain the effect of noise due to several sources connected in series and parallel. (7)

25. (a) (i) Discuss the implications of the information capacity theorem. (7)
- (ii) Explain the procedures to obtain Shannon fano coding with an example. (7)

(OR)

- (b) State and prove the properties of Mutual Information.
