MODEL QUESTION

SEVENTH SEMESTER B.TECH DEGREE EXAMINATIONS
(2013 Scheme)

13.704 COMMUNICATION SYSTEMS (E)

Time: 3 Hrs *Max marks: 100*

PART –A

Answer all questions

1. Distinguish between low level and high level modulation.
2. Discuss the advantages of SSB transmission.
3. Write a short note on choice of IF.
4. Calculate the total average power and maximum frequency deviation of given FM wave when it is present across 50Ω resistive load ; $x(t) = 10 \sin [10^8 \pi t + 3 \sin 2\pi \times 10^3 t]$
5. Describe the operation of FET reactance modulator
6. Explain the principle of power line carrier communication.
7. What is the use of duplexer in a radar system?
8. Briefly discuss video bandwidth.
9. Explain the frequency reuse concept of cellular networks.
10. Write a short note on PCSS.

(10 x 2 = 10)

PART –B

Answer one full question from each module

Module I

11. **a)** An AM wave given below is present across a load resistance of 50Ω

$x(t) = 20 [1+ 0.7 \cos 2000\pi t + 0.7 \cos 4000\pi t] \cos 20000 \pi t$,

Find (i) Sketch the frequency amplitude spectrum
(ii) The average power content of each spectral component
(iii) Total power
(iii) Modulation index.

(10)

b) Draw the block diagram of an AM broadcast transmitter. Explain the functions of each block. (10)

OR

12. **a)** Obtain the mathematical expression of an AM wave modulated by several sine waves. Also derive the relationship between the output power of the transmitter and depth of modulation. (10)

b) With the help of a block schematic explain the working of TRF receiver and discuss its limitations. (10)

Module II

13. **a)** Compare the characteristics of FM and AM. What are the advantages of FM over AM? (10)

b) With the help of a block diagram explain the operation of Armstrong FM transmitter. (10)

OR

14. **a)** Draw the circuit of a balanced slope detector and explain its working. (10)

b) List out the basic pulse modulation techniques and explain anyone in detail. (10)

Module III

15. **a)** Sketch and explain the details of composite video signal (10)

b) Explain the operation of a TV picture tube. (10)

OR

16. **a)** Derive the free space RADAR range equation. (10)

b) Draw the block diagram of a colour TV transmitter and describe its operation. (10)

Module IV

17. **a)** Draw the block schematic of an analog cellular transceiver and explain its operation. (10)

b) Explain the concepts (i) Cell splitting (ii) Sectoring (10)

OR

18. **a)** With the help of a block diagram explain the GSM architecture. (10)

b) Explain in detail the basic concepts of digital cellular telephone. (10)

(4 x 20 = 80)

Internal Question Paper Setters

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