Register Number.....

**B.E. DEGREE EXAMINATIONS: NOVEMBER 2009**

Fifth Semester

**ELECTRONICS AND COMMUNICATION ENGINEERING**

U07EC501 Communication Theory

**ee Hours** **Maximum Marks: 100**

**Answer ALL the Questions:-**

**PART A (10 x 1 = 10 Marks)**

tion Index $m_a$ is defined as

) $\frac{E_m}{E_c}$ (b) $\frac{E_c}{E_m}$ (c) $\frac{E_r}{E_m}$ (d) $\frac{E_m}{E_r}$

is total power transmitted when modulation index is 100%?

a)1.5Pc (b)1.6Pc (c)Pc.Pt (d)Pt.Pc/1.6

$f_d$ is 75Khz and $f_m$ is 5Khz. What is the bandwidth of an FM wave?

(a)80 Khz (b)160 Khz (c)40 Khz (d)70 Khz

ch of the following system is called constant bandwidth system?

(a)AM (b)FM (c)PM (d)DSB-SC

important performance characteristics of a Radio receiver is

(a)Sensitivity (b)Selectivity (c)fidelity (d) all the above

f AM receiver is

(a)455 Khz (b)450 Khz (c)454 Khz (d) 453 Khz

ure of merit of single tone AM is

(a) $m^2/(2+m^2)$ (b) $(2+m^2)/m^2$ (c) $3/2(mf)$ (d) $3/2(mf^2)$

ise to signal ratio in FM is

(a)High (b) Low (c) Increases with $f_m$ (d) decreases with reduction in

ntropy of the source is

(a) $H = \sum_{k=1}^{M} P_k \log_2(1/P_k)$ (b) $H = \log_2 P_k$

(c) $H = \sum_{k=1}^{M} \log_2(1/P_k)$ (d) $H = \sum_{k=1}^{M} \log_2(1/P_k)2$

Entropy when both messages are equally likely

(a)1 (b)2 (c)1.5 (d)2.5

## PART B (10 x 2 = 20 Marks)

11. Define amplitude modulation?
12. What are the advantages of SSB?
13. Write the expression for frequency modulated carrier?
14. Compare low level modulation and high level modulation
15. What is peak detector?
16. What are the drawbacks of TRF receiver?
17. Define noise factor?
18. Define Pre-emphasis?
19. What is Entropy?
20. What is channel redundancy?

## PART C (5 x 14 = 70 Marks)

21. (a) (i) Derive the mathematical expression for amplitude modulated carrier. (7)

(ii) Explain the operation of collector modulation for AM generation. (7)

**(OR)**

(b) (i) Discuss the features of Phase shift method of SSB generation (7)

(ii) Briefly explain operation of AM broadcast transmitter with block diagram (7)

22. (a). (i) Derive the formula for modulated FM and define the modulation index? (7)

(ii) Compare the features of Narrow band and Wide band FM (7)

**(OR)**

(b) (i) Explain the operation of Armstrong method of FM generation. (7)

(ii) Explain how frequency stabilization is done in FM transmitters (7)

23. (a) (i) Briefly explain the function of Ratio detector. (7)

(ii) With the aid of block diagram explain the operation of synchronous AM detector (7)

**(OR)**

(b) (i) Explain the operation of direct modulated FM transmitter (7)

(ii) Discuss the function and advantages of PLL (7)

(a) (i) Represent the narrow band noise in terms of envelope and phase components (10)

(ii) Two resistors R1 and R2 at absolute temperatures T1 and T2 are connected in series to form a white noise source. Find the equivalent noise temperature Teq (4)

**(OR)**

(b)(i) Prove that when 'a' is zero, the rician distribution reduces to the Rayleigh distribution. (7)

(ii) Discuss the importance of pre-emphasis and de-emphasis in FM. (7)

. (a) Explain the procedure to obtain Huffman coding

**(OR)**

(b) Discuss in brief the importance of differential entropy and mutual information for continuous channel

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