



M 21407

Reg. No. : .....

Name : .....

**IV Semester B.Tech. (Regular/Supplementary/Improvement – Including  
Part Time) Degree Examination, May 2012  
(2007 Admn. Onwards)  
PT 2K6/2K6 EC 403 : COMMUNICATION ENGINEERING – I**

Time: 3 Hours

Max. Marks : 100

***Instruction : Answer all questions.***

1. a) State and explain Wiener-Khinchin theorem.  
b) Define and explain :
  - i) ergodicity and
  - ii) correlation.  
c) What is white noise ? Give its properties.  
d) Derive the noise equivalent bandwidth of thermal noise.  
e) What are vestigial side band systems ? Who uses them ?  
f) Explain the sensitivity of a receiver.  
g) What is threshold effect in FM system ?  
h) Compare the narrow band FM and wide band FM. (8×5=40)
  
2. a) Obtain the expense of LTI systems to random process. 7  
b) State and prove any two properties of Gaussian random process. 8  

OR
3. a) What is stationarity ? Explain. State the conditions for stationarity. 7  
b) Write short notes on ensemble and time average. 8
  
4. a) Define and explain noise figure. 6  
b) Derive an expression relating noise figure with effective temperature of the system. 9

OR

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5. Write short notes on : (7<sup>1</sup>/<sub>2</sub>×2=15)
- a) Shot noise and thicker noise
  - b) Sources of noise.
6. a) Explain any two methods for DSB-SC generation with neat sketches. 7
- b) Derive an expression for SNR for DSB-SC wave. 8
- OR
7. a) Obtain the mathematical representation of AM wave. Draw its spectrum. 6
- b) Draw the block diagram of super-heterodyne receiver and explain the function of each block in detail. 9
8. a) Explain the principle of FM with mathematical expression. 7
- b) Explain how FM signal is generated using reactance modulator. 8
- OR
9. a) What is pre-emphasis and de-emphasis ? Explain. 6
- b) Draw a neat block diagram and explain the operation of a FM demodulator. 9
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