Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

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B.Tech.(Electronics & Computer Engg.) (2011 Onwards E-I) (Sem.–6)

COMMUNICATION SYSTEM

Subject Code : BTEL-904

M.Code : 71546

Time : 3 Hrs. Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

1. Answer briefly :

a) List three basic types of analog pulse modulation techniques. Which one is used as an intermediate step in PCM?

b) What is the purpose of sample and hold circuit?

c) What happens if the multiple massages are transmitted simultaneously without frequency translation?

d) State the basic requirement of analog communication system that can be met with the process of modulation.

e) Describe the term over-modulation with the help of diagram.

f) Why is modern communication systems equipped with AGC circuit?

g) What do you understand by coherent and non coherent detection of digital signal?

h) Define the terms selectivity, sensitivity, fidelity and image frequency with suitable example.

i) Draw block diagram of TRF AM radio receiver. Also state three disadvantages of the TRF AM radio receiver.

j) How constant frequency is achieved in the super-heterodyne receiver?

SECTION-B

2. Derive the relationship between the output power of AM transmitter and depth of modulation and plot it for various values of modulation index from zero to maximum.

3. How frequency modulation (FM) can be generated from phase modulation (PM)? Also draw and discuss the narrow band FM and PM generator/modulators.

4. Discuss the significance of noise triangle. How pre-emphasis and de-emphasis is used to avoid the effect of noise?

5. Explain how image frequency signals are received in super-heterodyne receiver. How can these signals be rejected?

6. Explain the generation and detection of pulse width modulation and pulse position modulation.

SECTION-C

7. In an Armstrong FM transmitter, the narrowband carrier frequency f_{c1} = 0.1 MHz and second carrier frequency f_{c2} =8.5 MHz and output carrier frequency is 100MHz and Δf = 75KHz. Calculate multiplying factors n_1 and n_2 if narrowband frequency deviation is 10Hz.

8. How sampling takes place in digital communication? Derive mathematical expression to elaborate the working of sampling. Describe Pulse code modulation.

9. An FM modulator operates at carrier frequency of 500 KHz with frequency deviation sensitivity of 1.5 KHz/V. A PM modulator operates at a carrier frequency of 500 KHZ with phase deviation sensitivity of 0.75 rad/v. both FM and PM modulators are modulated by the same modulating signal having peak amplitude of 4 V and modulating frequency of 2 KHz.

   a) Is it possible to distinguish the FM spectrum from the PM spectrum?

   b) If the modulating frequency is changed to 1 KHz, is it now possible to distinguish the FM spectrum from the PM spectrum?

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.