GANPAT UNIVERSITY

B. Tech Semester - IV (CE/IT)
Regular Examination May-June 2013
2CE404/2IT404: Basics of Communication Systems

Time: 3 Hours]   [Total Marks: 70

Instructions:
1. Attempt all questions.
2. Figures to the right indicate full marks
3. Each section should be written in a separate answer book

SECTION-I

Q-1. **Answer the following**

(A) Explain the following line coding schemes?   4
   a) NRZ-L   b) Manchester

(B) What is the Nyquist sampling rate for each of the following signals?   4
   a. A low-pass signal with bandwidth of 200 KHz?
   b. A band-pass signal with bandwidth of 200 KHz if the lowest frequency is
   100 KHz?

(C) Draw the constellation diagram for the following cases. Find the peak amplitude   4
   value for each case and define the type of modulation (ASK, FSK, PSK, or QAM).
   The numbers in parentheses define the values of I and Q respectively.
   a. Two points at (2, 0) and (3, 0).
   b. Two points at (3, 0) and (-3, 0).
   c. Four points at (2, 2), (-2, 2), (-2, -2), and (2, -2).
   d. Two points at (0, 2) and (0, -2).

OR

Q-1. **Answer the following**

(A) Explain the Frequency Modulation in detail.   4
(B) Distinguish between baseband transmission and broadband transmission.   4
(C) Explain the following line coding schemes?   4
   a) MLT-3   b) 2B1Q

Q-2. **Answer the following**

(A) What is sampling. Explain the types of sampling.   6
(B) Define the analog hierarchy used by telephone companies and list different levels   5
   of the hierarchy.

OR

Q-2. **Answer the following**

(A) What is quantization in PCM Encoder? Explain in detail.   6
(B) Define the digital hierarchy used by telephone companies and list different levels   5
   of the hierarchy.

Q-3. **Answer the following**

(A) Distinguish between synchronous and statistical TDM.   6
(B) Explain three types of transmission impairment.   6

[P.T.O]

Q-4. **Answer the following**

(A) We need a three-stage space-division switch with N = 100. We use 10 crossbars at the first and third stages and 6 crossbars at the middle stage.
a. Draw the configuration diagram.
b. Calculate the total number of crosspoints and compare it with cross points for simple crossbar switch. **6**

(B) Explain different modes of Data flow (simplex, half duplex and full duplex) with simple diagram. **3**

(C) What is the significance of the twisting in twisted-pair cable? **2**

Q-5.

(A) Draw the layered architecture of the OSI model and explain functions of user support layers. **6**

(B) Categorize and explain the basic network topologies with figure. **6**

OR

Q-5.

(A) Explain banyan switch with figure. **6**

(B) Explain Multimode step index and Multimode graded index fiber with figure. **6**

Q-6.

(A) List out various Unguided Media and explain microwave with its characteristics and applications. **6**

(B) Compare and contrast a traditional cable network with a hybrid fiber-coaxial network. **6**

OR

Q-6.

(A) What is DSL technology? What are the services provided by the telephone companies using DSL? Distinguish between a DSL modem and a DSLAM. **6**

(B) Describe Virtual-Circuit Networks. **6**

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