

**M.Tech. IN ADVANCED INFORMATION  
TECHNOLOGY – NETWORKING AND  
TELECOMMUNICATION (MTECHTC)**

**Term-End Examination**

**June, 2015**

00013

**MINI-025 : SPECIAL TOPICS IN NETWORKING AND  
TELECOMMUNICATIONS**

**Important Instruction :** This question paper should be attempted only by those candidates who have registered for July, 2010 Batch only.

*Time : 3 hours*

*Maximum Marks : 100*

- Note :** (i) Assume suitable data wherever required.  
(ii) Draw suitable sketches wherever required.  
(iii) Answer the two sections in separate answer booklets.

**SECTION I**

*Solve any four questions from this section :*

1. (a) Describe the applications of queuing theory in communication systems. 6  
(b) The pdf of a uniformly distributed random variable in the interval (a, b) is given by

$$f_x(x) = \begin{cases} 1/b - a & a \leq x \leq b \\ 0 & \text{otherwise} \end{cases}$$

Find  $F_x(x)$ . 6

2. (a) What is “Fading effect” ? List the different types of fading and their distributions. 6
- (b) What are “Orthogonal codes” ? Explain with a suitable example, how do we find if two codes are orthogonal. 6
3. (a) What is meant by “Finite State Machine” ? List few applications of the same in communication networks. 6
- (b) Explain why scripting languages are necessary for network testing. Give two examples. 6
4. (a) What is Multiprotocol Label Switching (MPLS) ? What are its advantages and features ? 6
- (b) Compare the features of Digital Subscriber Line (DSL) and Asymmetric Digital Subscriber Line (ADSL). 6
5. (a) Explain with the help of a suitable diagram, “Token Bucket Algorithm”. List a few applications of the same in communication networks. 6
- (b) Give the call flow for a typical VoIP call. 6
6. Write a ‘C’ program that creates a linked list, adds 5 nodes in the middle to it, deletes nodes from the end of the test. 12

## SECTION II

*Solve any four questions from this section :*

7. (a) What is the difference between “Voice Gateway” and “Gatekeeper” ? Illustrate with the help of a suitable diagram. 7
- (b) What are the basic building blocks of a CDMA system ? 6
8. (a) What is diffraction of radio waves and how is it caused ? 6
- (b) What is the use of ISUP in a telephone network ? 7
9. Draw the architecture of Next Generation Networks. Explain log analysis and typical reasons why network administrators perform log analysis. 13
10. (a) List any four characteristics of a “structured protocol”. 4
- (b) List any four rules of a good protocol design. 4
- (c) List the protocols used to achieve “Quality of Service” over an IP network. 5
11. (a) Explain “Direct Sequence Spread Spectrum” (DSSS) technique. 6
- (b) Compare DSL and T-1 line with regard to technology used, data rates, application areas, type of media used, etc. 7
12. Write a ‘C’ program using array which stores the students’ records and prints the output on a file. 13