

5E3252

B.Tech. V Sem. (Main/Back) Examination Dec. 2012

Computer Science

5CS3 Telecommunication Fundamentals

Common for CS &amp; IT

Time : 3 Hours

Maximum Marks : 80

Min. Passing Marks : 24

*Instructions to Candidates:*

*Attempt any five question selecting one question from each unit .  
All Questions carry equal marks. Schematic diagrams must be  
shown wherever necessary. Any data you feel missing suitably be  
assumed and stated clearly. Units of quantities used / calculated  
must be stated clearly.*

Use of following supporting material is permitted during examination.  
(Mentioned in form No. 205)

1. \_\_\_\_\_ Nil

2. \_\_\_\_\_ Nil

**UNIT-I**

- Q.1 (a) What is channel capacity? Discuss Shannon capacity formula.  
Suppose there is spectrum of a channel 3Mhz &  $SNR_{dB} = 24dB$  then  
find out its capacity & How many signaling levels are required.  
[2+4+4=10]
- (b) What is the difference between OSI model & TCP/IP model? [6]

**OR**

- Q.1 (a) What are the various transmission media? Explain guided media in  
detail. [8]
- (b) What is transmission impairments? Explain. [4]
- (c) Consider a stream of binary sequence 0100101011. Draw the wave  
form for this sequence using- [4]
- (i) Manchester encoding (ii) NRZ  
(iii) Bipolar - AMI (iv) Pseudo ternary

## UNIT-II

- Q.2 (a) What is sliding window protocol? what should be the size of window? Explain. [8]
- (b) Define following:-
- (i) Bit stuffing
  - (ii) Parity check
  - (iii) Checksum
  - (iv) Functions of data link layer [4x2=8]

OR

- Q.2 (a) Give the mathematical derivation of stop & wait ARQ. [8]
- (b) Find the FCS for message  $D=1010001101$  & Pattern  $P=110101$  by the cyclic redundancy check. [8]

## UNIT-III

- Q.3. (a) What is HDLC? Explain [8]
- (b) How slotted aloha is twice more efficient than pure aloha ? [4]
- (c) What is channel allocation methods ? [4]

OR

- Q.3. (a) What is CSMA/CD? Explain. [8]
- (b) Compare throughput of CSMA & CSMA/CD. [4]
- (c) Define collision free multiple access. [4]

### UNIT-IV

- Q.4 (a) Explain TDMA frame structure. [4]  
(b) Compare TDM & FDM. [4]  
(c) Explain time division & space- time - space division multiplexing. [8]

**OR**

- Q.4 (a) Explain synchronus TDM. [4]  
(b) What is the TDMA super frame structure? Explain. [4]  
(c) Explain ADSL, Compare performance of FDMA & TDMA [8]

### UNIT-V

- Q.5 (a) What are the various spread spectrum techniques? Explain frequency hopped spread spectrum techniques. [8]  
(b) Explain CDMA. What is forward & reverse CDMA channel ? [8]

**OR**

- Q.5 (a) Describe following -  
(i) M-sequence  
(ii) Handoff  
(iii) IMT-2000 [12]  
(b) What is Walsh code synchronization ? Explain. [4]