

Registration no:

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Total Number of Pages: 02

**M.TECH**  
**WCPE 107**

**1<sup>st</sup> Sem MTech Regular/ Back Examination – 2015-16**

**DATA COMMUNICATION AND NETWORKING**

**BRANCH(S): WCT**

**Time: 3 Hours**

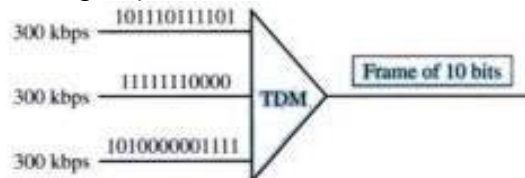
**Max marks: 70**

**Q.CODE:T1245**

**Answer Question No.1 which is compulsory and any five from the rest.  
The figures in the right hand margin indicate marks.**

- Q1 Answer the following questions: (2 x 10)
- What are the responsibilities of the transport layer in OSI reference layer structure?
  - Encode the binary stream 101101 using i) NRZ-I ii.) Manchester coding schemes.
  - What does it mean if a NAK frame for Selective Repeat ARQ contains a number 100?
  - Draw a cell pattern with a frequency reuse factor of 3.
  - What is reply attack? Name two user authentication systems that are vulnerable to a reply attack.
  - Explain the three persistence methods used in CSMA.
  - A packet has arrived in which the offset value is 100, the value of HLEN is 5, and the value of the total length field is 100. What are the numbers of the first byte and the last byte?
  - A signal is sampled. Each sample represents one of four levels. How many bits are needed to represent each sample? If the sampling rate is 8000 samples per second, what is the bit rate?
  - Differentiate the unicast routing and multicast routing.
  - A block of addresses is granted to a small organization. If one of the addresses is 205.16.37.39/28, what is the first address in the block?

- Q2 a) For a TDM system as represented below, if the slot is only 10 bits long (3bits taken from each input plus 1 framing bit), (5)



- What is the output bit stream?
  - What is the output bit rate?
  - What is the duration of each bit in the output line?
  - How many slots are sent per second?
  - What is the duration of each slot
- b) Three audio lines, each using 4 KHz, are frequency multiplexed together using AM and cancelling the lower modulated band. Draw the frequency-domain representation of the resulting signal if the carrier frequencies are at 4, 10, and 16 KHz respectively. (5)

What is the bandwidth of the resulting signal?

- Q3 a) Explain the DS hierarchy. How are T lines related to DS service? (4)  
b) Draw the flow diagram for the CSMA/CD and explain its operation. (4)  
c) Define the type of the following destination (Ethernet) addresses: (2)  
i.) 4A:30:10:21:10:1A ii.) 47:20:1B:2E:08:EE
- Q4 a) Explain the sliding window flow control mechanism in TCP with example. (5)  
b) Describe the operation of stop-and-Wait ARQ protocol. How does Go-back-N ARQ differ from stop-and-wait ARQ protocol? (5)
- Q5 a) Represent the IPv4 datagram format and explain about each of its field. (5)  
b) What is(are) the purpose(s) of using ICMP in IP protocol? Explain the error reporting tasks performed by ICMP. (5)
- Q6 a) Explain the distance vector routing mechanism with an example. (5)  
b) What is HDLC? Explain the frame format of it. (5)
- Q7 a) Explain the various steps involved in generating ciphertext from plain text using DES. (5)  
b) Encrypt and decrypt the messages "BE" using RSA algorithm with key pairs (3, 15) and (5, 15). For two prime numbers  $p=19$  and  $q=23$ , find N, e, and d. (5)
- Q8 Write short notes on any TWO (5 x 2)  
a) Selective Repeat ARQ  
b) CSMA/CA  
c) SHA-1 hash algorithms