*Total No. of Questions : 8]* *[Total No. of Printed Pages : 2*



**Roll No** .....

# IT-5005 (C) (CBGS)

## B.E. V Semester

Examination, December 2017

## Choice Based Grading System (CBGS)

## Data Communication

***Time : Three Hours***

***Maximum Marks : 70***

***Note:*** i) Answer any five questions.
ii) All questions carry equal marks.
iii) Assume suitable value for missing data, if any.

1. a) What is the advantage of digital transmission over analog signals?
   b) A noise less 4kHz channel is sampled every 1m sec. What is the maximum data rate?



2. a) Describe about the Nyquist's theorem?
   b) What Signal to noise ratio is needed to put a T1 carrier on a 50kHz line?

3. a) There are four sources, each creating 250 characters per second. If the interleaved unit is a character and 1 synchronizing bit is added to each frame. Find
      i) The data rate of each source
      ii) The duration of each character in each source
      iii) The frame rate
      iv) Duration of each frame
      v) The number of bits in each frame
   b) Explain the parallel and serial transmission in detail?







4. a) Compare a delay in sending a 'x' bit message over a 'K' hop path in a circuit switch network and in a lightly loaded packet switch network, circuit setup time is 's' sec. The propagation delay is 'd' sec/hop the packet size is 'p' bit and data rate is 'b' bps under what condition does the packet network have a lower delay.
   b) Explain ISDN services?

5. a) If the 7-bit Hamming code word received by the receiver is 1011011. Assuming the even parity state whether the received code word is correct or wrong. If wrong, locate the bit in error.
   b) Suppose we are sending data item of 16bit length. If two data items are swapped during transmission, can the traditional checksum detect this error? Explain.



6. a) What is a Bit Stuffing? In a data link layer, the frame delimiter flag is given by 0111. Assuming that bit stuffing is employed, the transmitter want to send the data sequence 01110110, what is the transmitted bit sequence?
   b) Explain Synchronous Digital Hierarchy (SDH) in detail?

7. a) What is the difference between unshielded twisted pair and shielded twisted pair? Why are the wires twisted in twisted pair copper wire?
   b) Explain the radio waves in detail?

8. Write the short note (any three):
   a) Point to point and point to multipoint transmission
   b) Fiber optic cable
   c) Synchronous and Asynchronous transmission
   d) Frequency division multiplexing
   e) Shannon capacity



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