

**BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(END SEMESTER EXAMINATION)**

**CLASS: BE
BRANCH: IT**

**SEMESTER : V
SESSION : MO/19**

SUBJECT: IT5021 DATA COMMUNICATIONS

TIME: 3 HOURS

FULL MARKS: 60

INSTRUCTIONS:

1. The question paper contains 7 questions each of 12 marks and total the 84 marks.
 2. Candidates may attempt any 5 questions maximum of 60 marks.
 3. The missing data, if any, may be assumed suitably.
 4. Before attempting the question paper, be sure that you have got the correct question paper.
 5. Tables/Data hand book/Graph paper etc. to be supplied to the candidates in the examination hall.
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- Q.1(a) What are the reasons for using layered protocols? [2]
- Q.1(b) Compare the OSI and TCP/IP reference models. Which model is more popular and why? [4]
- Q.1(c) Draw the layer diagram of the TCP/IP protocol suite and explain it briefly. [6]
- Q.2(a) What do you mean by channel bandwidth? [2]
- Q.2(b) Calculate the maximum bit rate for a channel having bandwidth 3100 Hz and S/N ratio is 20 dB. [4]
- Q.2(c) Perform the comparison between twisted pair, co-axial, and optical fiber cables. [6]
- Q.3(a) What is meant by Bauds? [2]
- Q.3(b) Define the sampling theorem. [4]
- Q.3(c) Explain the NRZ encoding techniques with its variation. [6]
- Q.4(a) What do you mean by flow control? [2]
- Q.4(b) Two neighboring nodes A and B uses a sliding window protocol with a 3-bit sequence number. As the ARQ mechanism, GO-Back-N is used with a window size of 4. Assume A is transmitting, and B is receiving Show window position for the event:
After A send frame 0,1,2 and receive ACK (acknowledgement) from B for 0,1. [4]
- Q.4(c) A series of 8-bit message blocks(frames) is to be transmitted across a data link using a CRC for error detection. A generator polynomial of 11001 is to be used. Use an example to illustrate the CRC process. [6]
- Q.5(a) Define the frequency division multiplexing. [2]
- Q.5(b) Discuss the Go-Back-N ARQ technique using an example. [4]
- Q.5(c) Explain the different frame types of HDLC using a suitable diagram. [6]
- Q.6(a) Define the X.25. [2]
- Q.6(b) Explain the different phases in the circuit switching technique. [4]
- Q.6(c) Compare the circuit switching, datagram packet switching, and virtual circuit switching technique. [6]
- Q.7(a) Define the cells in ATM. [2]
- Q.7(b) Define the ATM protocol architecture using a diagram. [4]
- Q.7(c) Explain the desirable properties of a routing algorithm [6]

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