



INSTITUTE OF INFORMATION TECHNOLOGY
JAHANGIRNAGAR UNIVERSITY

2nd Year 1st Semester Final Examination-2020 [Written]

Course Title: Data and Tele Communication
2109

Course Code: ICT

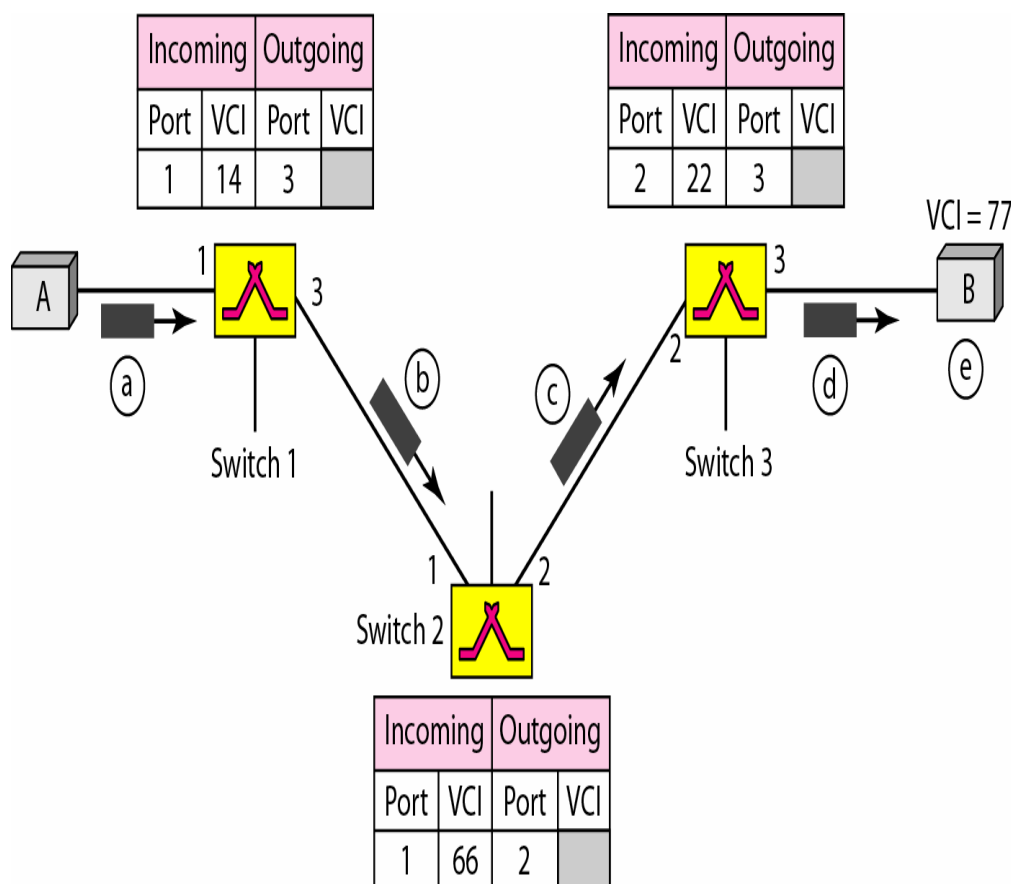
Time: 45 Minutes, Plus Extra 15 Minutes for Submission

Marks: 10

Instructions:

- There are Three Questions here. Answer any TWO (02) of them.
- Marks carrying by each question are shown in the margin.
- Upload the pdf answer script in the Google Class Room.

- Why data is to be converted to signal? List three techniques that can convert digital data into digital signal. 1.5
 - Distinguish between 'data element' and 'signal element' with an analogy. What is the relationship between 'data rate' and 'signal rate'? 1.5
 - What is the total delay for a frame of size 5 million bits that is being sent on a link with 10 routers each having a queuing time of $2 \mu\text{s}$ and a processing time of $1 \mu\text{s}$. The length of the link is 2000 Km. The speed of light inside the link is $2 \times 10^8 \text{ m/s}$. The link has a bandwidth of 5 Mbps. 2
- Consider the following snapshot. Briefly explain each step involved to send a packet from Source A to Source B using virtual circuit. 5



- What is 'modulation' and 'demodulation'? Why is modulation required for data communication? 1.5
 - What is the effect of high SNR and low SNR on signal while transmitting? 1.5
 - Assume we are sending data items of 16-bit length. If two data items are swapped during transmission, how many and what types of errors cannot be detected by traditional checksum calculation? Explain 2