

TIPS TO SOLVE QUESTIONS BASED ON CASE STUDY (5 MARKS)

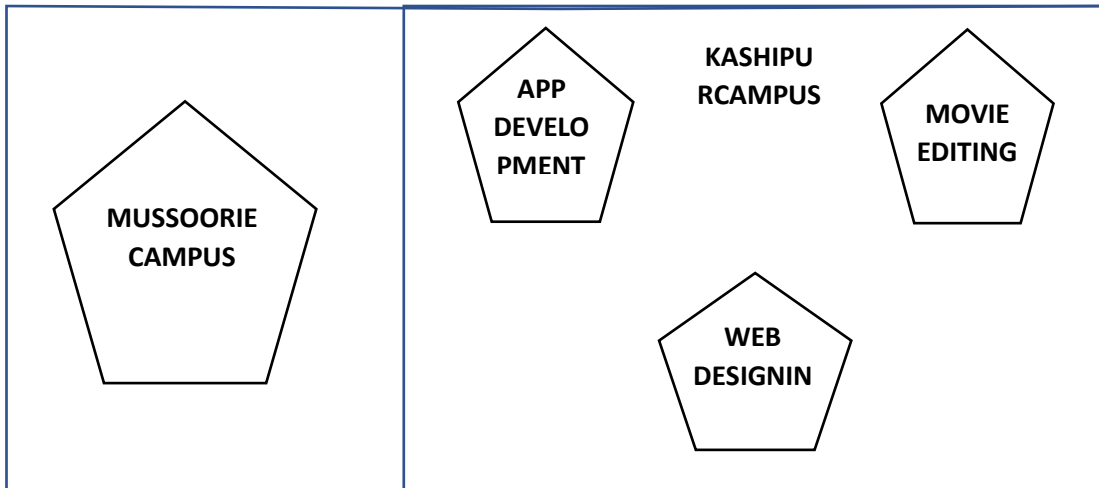
- 1. Name the most suitable wing where the server should be installed.**
Server should be placed in the building/wing, where number of computers are maximum
- 2. Draw the cable layout.**
 - a. Use star topology or
 - b. Use the 80-20 rule (connect the buildings having shortest distance. For N buildings, N-1 wires are required. No loops
(**80-20 rule:** If a block is expected to have 100 network connections, design the initial cabling to support 80 connections (80%), leaving 20 cables (20%) for future use.)
- 3. Suggest the placement of networking devices.**
 - a. Hub/Switch: In all building/office/wing to connect all the computers.
 - b. Repeaters: In between the building/office/wing where distance is more than 70 meters to regenerate the signals.
 - c. Modem (Internet Connecting Device): Should be installed at wing/building/office that have maximum number of computers (or where server is installed).
 - d. Firewall (Hardware or software): a network security device to prevent unauthorized access to or from the network.
- 4. Which communication medium or Internet connecting Technology is used for connecting offices?**
 - a. **Case 1:** If cost is not the problem (compromised) but speed is needed then use Optical Fiber in urban areas and use satellite communication if cable connection is not possible for for Hilly area and Long distances.
 - b. **Case 2:** Compromise with speed but not with cost: Use broadband technologies like dial-up connection (DSL) or cable (Coaxial) and use radio wave communication if cable connection is not possible in hilly area and long distance.
 - c. **Case 3:** Within campus/office/building, always use Ethernet twisted pair cable for economical and easy installation. For portability, you can use wifi radio wave.

Note:

- a. The best wireless communication medium is Satellite.
- b. Moderate/Economical wireless medium is Radio wave and microwave.
However in hilly areas, radio wave is preferable.
- c. The best wired medium for high speed is optical fiber
- d. The moderate/economical wired medium is coaxial and Ethernet twisted pair cable

SAMPLE QUESTIONS:

QUESTION: MakeInIndia Corporation, an Uttarakhand based IT Training company, is planning to set up training centres in various cities in next 2 years. Their first campus is coming up in Kashipur district. At Kashipur campus, they are planning to have 3 different blocks for App development, Web designing and Movie Editing. Each block has number of computers, which are required to be connected in a network for communication, data and resource sharing. As a network consultant of this company, you have to suggest the best network related solutions for them for issues/problems raised in question nos. (i) to (v), keeping in mind the distances between various blocks/locations and other given parameters.



Distance between various blocks/locations:

BLOCK	Distance
App Development to Web Designing	28 m
App Development to Movie Editing	55 m
Web Designing to Movie Editing	32 m
Kashipur Campus to Mussorie Campus	232 km

Number of computers

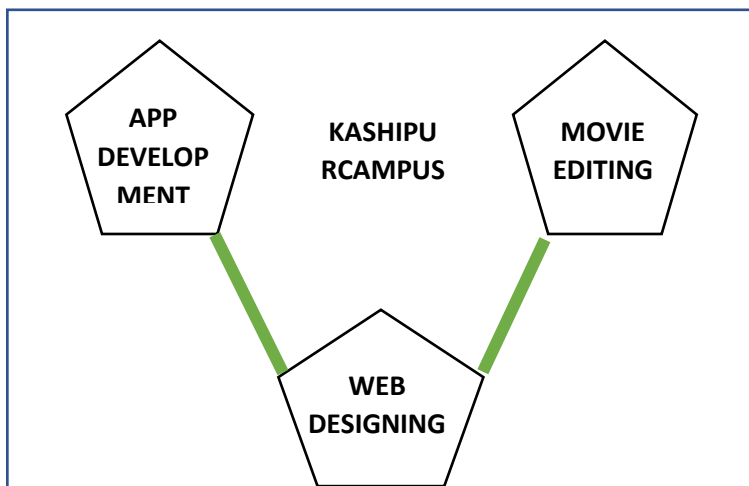
BLOCK	Number of Computers
App Development	75
Web Designing	50
Movie Editing	80

- i. Suggest the most appropriate block/location to house the SERVER in the kashipur campus (out of 3 blocks) to get the best and effective connectivity. Justify your answer. (0.5 mark for naming the server block and 0.5 mark for correct reason)
- ii. Suggest a device/software to be installed in the Kashipur Campus to take care of data security. (1 mark for the correct answer)
- iii. Suggest the best wired medium and draw the cable layout (Block to Block) to economically connect various blocks within the Kashipur Campus. (0.5 mark for correct wired medium and 0.5 mark for cable layout)

- iv. Suggest the placement of the following devices with appropriate reasons:
- Switch/Hub
 - Repeater
- (0.5 marks each)
- v. Suggest the protocol that shall be needed to provide Video Conferencing solution between Kashipur Campus and Mussoorie Campus. (1 mark for correct protocol)

ANSWERS:

- Movie Editing block is the most appropriate to house the server as it has the maximum number of computers.
- Firewall
- Bus topology



- A. Switch/Hub will be placed in all blocks to have connectivity within the block.
B. Repeaters is not required between the blocks as the distances are less than 100 m.
- Protocol: VoIP