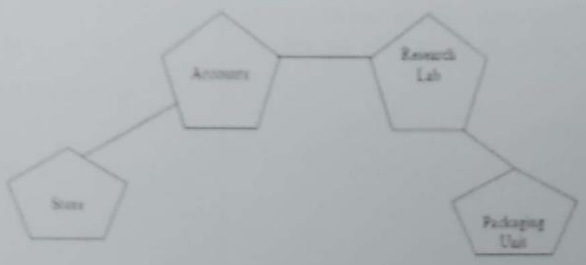
1.

(i) Layout 1



Layout 2

(Any of the above)

(1 mark for drawing correct layout)

(ii)The most suitable place/ building to house the server of this organization would be building Research Lab, as this building contains the maximum number of computers.

(1 mark for correct answer)

(iii)
a) For layout1, since the cabling distance between Accounts to Store is quite large, so a repeater would ideally be needed along their path to avoid loss of signals during the course of data flow in this route. For layout2, since the cabling distance between Store to Recresearch Lab is quite large, so a repeater would ideally be placed.

b) In both the layouts, a Hub/Switch each would be needed in all the buildings to interconnect the group of cables from the different computers in each building.

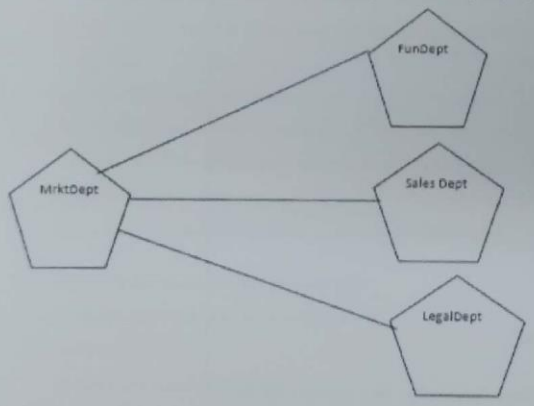
(½ mark for each correct answer)

(iv) Firewall

(1 mark for correct answer)

1.

i) Suggest a cable layout of connections between the Departments and specify topology.



Star Topology should be used.
[1/2 mark for cable layout]
[1/2 mark for topology]

ii) Suggest the most suitable building to place the server a suitable reason with a suitable reason.
Ans: As per 80 – 20 rule, MrktDept beacause it has maximium no. of computers.
[1 mark for the correct Answer]

iii) Suggest the placement of i) modem ii) Hub /Switch in the network.
Ans: Each building should have hub/switch and Modem in case Internet connection is required.
[1 mark for the correct Answer]

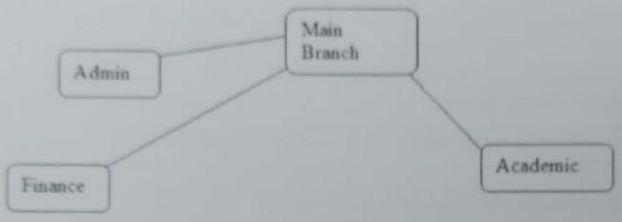
iv) The organization is planning to link its sale counter situated in various part of the same city. which type of network out of LAN, WAN, MAN will be formed? Justify.

Ans : MAN (Metropolitan Area Network)

[1 mark for the correct Answer]

2.

(a) Star topology



(1 mark for drawing correct layout)

(b) Server should be placed at Main Building as it has the maximum number of computers.

(1 mark for correct answer)

(c) Hub/Switch each would be needed in all the buildings to interconnect the group of cables from the different computers in each building

A repeater needs to be placed along the wire between main building & finance building as the distance between them is more than 70 mtr.

(½ mark for each correct placement)

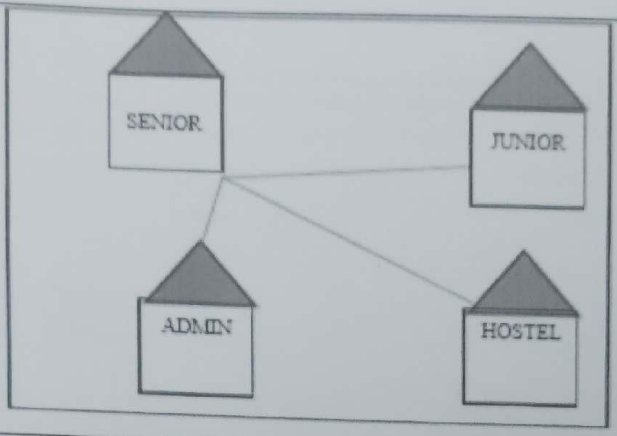
(½ mark for each correct justification)

(d) Optical Fibre

(1 mark for correct answer)

3.

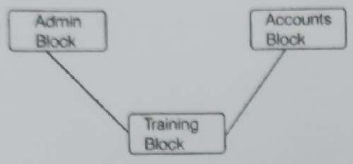
(i)	Suggest the best wired medium and draw the cable layout to efficiently connect various wings of Multipurpose PublicSchool, Bangluru.
Ans	Best wired medium: Optical Fibre OR CAT5 OR CAT6 OR CAT7 OR CAT8 OR Ethernet Cable

	
	(½ Mark for writing best wired medium) (½ Mark for drawing the layout correctly)
(ii)	Name the most suitable wing where the Server should be installed. Justify your answer.
Ans.	Wing Senior(S)- Because it has maximum number of computers.
	(½ Mark for correct Wing) (½ Mark for valid justification)
(iii)	Suggest a device/software and its placement that would provide data security for the entire network of the School.
Ans.	Firewall - Placed with the server at Senior OR Any other valid device/software name
	(½ Mark for writing device/software name correctly) (½ Mark for writing correct placement)
(iv)	Suggest a device and the protocol that shall be needed to provide wireless Internet access to all smartphone laptop users in the campus of Multipurpose Public School, Bangluru.
Ans.	Device Name: WiFi Router OR WiMax OR RF Router OR Wireless Modem OR RFTransmitter Protocol : WAP OR 802.16 OR TCP IP OR VOIP OR MACP OR 802.11
	(½ Mark for writing correct device name) (½ Mark for writing correct protocol)

4.

(i) Training Block is the most appropriate block/location to house the SERVER in the CHENNAI office to get the best and effective connectivity because it has maximum number of computers.

(ii)



(iii) Suggested device is firewall. And it will be placed where all messages are entering or leaving the entire network of the CHENNAI office.

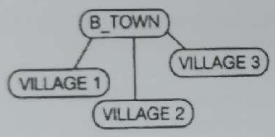
(iv) Device: WiFi card

Protocol: TCP/IP

5.

(i) B_TOWN is the most appropriate location of the server inside the B_HUB because it has maximum number of computers.

(ii)



Ethernet cable is the best wired medium to connect the various locations within the B HUB.

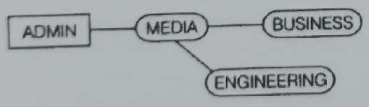
(iii) Switch

(iv) Telnet

6.

(i) ADMIN is the most appropriate location of the server inside the CHENNAI campus because it has maximum number of computers.

(ii)



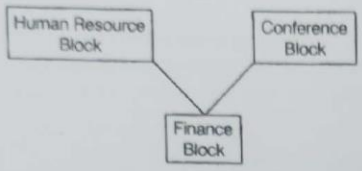
(iii) Firewall

(iv) (c) Video Conferencing

7.

(i) TTC should install its server in Finance Block because it has maximum number of computers.

(ii)



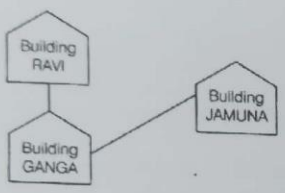
(iii) Satellite Link

(iv) Switch

8.

(i) The most suitable place to house the server in building JAMUNA because it has maximum number of computers.

(ii)

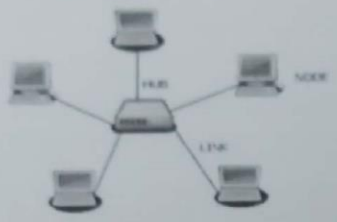


(iii) **Switches** are needed in every building as they help share bandwidth in every building.
Repeaters may be skipped as per above layout(because distance is less than 100 m) however if building RAVI and building JAMUNA are directly connected, we can place a repeater there as the distance between these two building is more than 100 m.

iv.optical fibre

WS-15

1. Ans. Due to the centralized nature of the star topology it offers simplicity of operation. In star topology failure of single system will not bring down the entire system while in bus topology, if main communication link fails then entire system will bring down.



STAR TOPOLOGY

2. Ans. Domain name: helpinghand
   URL: http://www.helpinghand.in/home/aboutus.htm
3. Ans. Uninterrupted power supply.
4. Ans. The economical cable with high speed data transfer can be co-axial cable.

5. Ans. A. star topology. B. bus topology.
6. Ans. http://www.google.com and http://www.yahoo.com
7. Ans. Internet explorer and Mozilla firefox.
8. Ans. Let us consider a web address: http://www.helpingeachother.in/home/aboutus.htm
   Here domain name: helpingeachother
   URL: http://www.helpingeachother.in/home/aboutus.htm
9. Ans. Repeater.
10. Ans. i. repeater.
    ii.LAN.
11. Ans. i. advantages of bus topology: short cable length. Easy to extend.
    disadvantages of bus topology: fault diagnosis is difficult. Nodes must be intelligent to select the data send.
    ii.advantages of star topology: one device per connection. Easy to access.
    Disadvantages of star topology: long cable length. Central node dependency.
12. Ans. A. share resources, share software, share storage.
    B. communication with each other becomes easier.
13. Ans. i. satellite communication.
ii.bluetooth or infrared whichever is supported by phone.
14. Ans. i. microwaves. Ii. Satellite.
15. Ans. Mbps (mega bits per second) is the unit which is used to measure the speed of a network.
16. Ans. The two available choices of communication media are:
    i. Guided media or wired technologies: it includes different types of cables like coaxial cable, fibre optic cable, twisted pair cable.
    ii. Unguided media or wireless technologies: it includes waves through air, vacuum or water.
17. Ans. Coaxial cable consists of a solid wire core surrounded by one or more foil or wire shields, separated by some kind of plastic insulator. The inner core carries the signal, and the shield

provides the ground. It has high electrical properties and suitable for high speed communication. Widely used for television signals.
Optical fibre consists of thin stands of glass or glass like material which are so constructed that they carry light from a source at one end of the fibre to a detector at the other end. The light sources used are either light emitting diodes (LEDs) or laser diodes (LDs).

18. Ans. B. uninterrupted power supply (UPS).
19. Ans. Advantage: it is Immune to electrical and magnetic interference i.e noise in any form because the information is travelling on a modulated light beam.
Disadvantage: Installation problems. Quite fragile and may need special care to make them robust for office.
20. Ans. A hub forwards each incoming packet (data) to all the ports connected to hub. A switch on the other hand forwards each incoming packet (data) to the specified recipient only. That is why switch is called an intelligent hub,
21. Ans. A repeater is a network device that amplifies and restores signals for long distance transmission. Basically repeaters are used in network so that a signal can travel longer distance.
22. Ans. Switch is a Device that is used to segment networks into different subnetworks called subnets or LAN segments. Segmenting prevents traffic overloading. Switch is responsible for filtering i.e transforming data in a specific way and for forwarding packets (a piece of message) between LAN segments.
23. Ans.

Star topology	Bus topology
All the nodes are directly connected with the central node or server.	There is single length of transmission medium, on which various nodes are attached and the server can be anywhere in the transmission cable.
Easy to detect faults.	Faults cannot be easily detected.
It is fast in transmission.	Becomes slow with increase in nodes.

24. Ans.

LAN	WAN
Local area network is A network that connects a group of computers in a small geographical area.	Wide area network spans large locality and connects countries together. Example internet.
Area covered is A few meters to a few kilometers (upto 10km radius)	Area covered is Entire country, continent or globe (no upper limit)
Error rates lowest	Error rates highest
Transmission speed high	Transmission speed low
Design and maintenance easy	Design and maintenance difficult

25. Ans. A hub is a hardware device used to connect several computer together. Hubs interconnect group of networks. Forwards data from one workstation to all other. Two types of hubs:
1 active hubs: electrically amplify the signals as it moves from one connected device to another. Active hubs are used like repeaters to extend the length of network.
2. passive hubs: allow the signal to pass from one computer to another without any changes.
26. Ans. They formed a Personal Area Network (PAN). PAN refers to a small network of communication capable (IT enabled) devices within a range of reachability of an individual person.
27. Ans. A modem is a computer peripheral that allows you to connect and communicate with other computers via telephone lines. Because ordinary telephone lines cannot carry digital information, a modem changes the digital from your computer into analog data. The modem

receiving the call then changes the analog signal back into digital data. This shift of digital data into analog and back again, allows two computers to "speak" with one another Called modulation/demodulation.

28. Ans. A gateway is a network device that connects dissimilar networks. It establishes an intelligent connection between a local network and external networks with completely different structures. A gateway is actually a node on a network that serves as an entrance to another network. In homes the gateway is the ISP that connects the user to the internet.
29. Ans. i. switch. ii. Repeater.
30. Ans. Star topology is the network topology in which each node is connected independently using a switch.
31. Ans. i. gateway. Ii. Modem.
32. Ans. Advantage of star topology: one device per connection so one failure does not affect others.

Advantage of bus topology: short cable length and simple wiring decreases installation cost. Simple and easy to maintain.

33. Ans. Advantage of star topology over bus topology: the star topology is the most reliable as there is a direct connection of every nodes in the network with the central node, so any problem in any node will affect the particular node only. While in bus topology, if problem exists in common medium, it will affect the entire node.
    Advantage of bus topology over star topology: extension of network is very easy in bus topology, we can connect new node along its length. While in star topology, it is difficult to expand, as the new node has to connect all the way to central node and there is not available port in central node.
34. Ans. Five types of networks are:
    i. Local Area Network (LAN).
    ii. Metropolitan Area Network (MAN).
    iii. Personal Area Network (PAN).
    iv. Wide Area Network (WAN).
    v. Virtual Private Network (VPN).
35. Ans. i. the device that can be installed between the office for smooth communication is repeater.
    ii. the type of network is Local Area Network (LAN).
36. Ans. i. .edu indicates education website. ii. .org indicates organization websites.
37. Ans. MAC address is assigned by the manufacturer, while IP address is assigned by the network administrator or internet service provider (ISP). Thus, if a computer is transferred from one network to another, its IP address gets changed where as the MAC address remains the same.
38. Ans. A protocol is a set of rules for communication among networked devices. Protocols generally includes rules of how and when a device can send or receive the data, how is the sent data packaged, and how it reaches its destination. The protocol used to search the information from internet using browser is HyperText Transfer Protocol (HTTP).
39. Ans. i. HTTP HyperText Transfer Protocol

ii.Near Field Communication
iii.Global System for mobile communication
iv.Fourth Generation
v.Hyper Text Transfer Protocol
vi.File Trasnfer Protocol
vii.Simple Mail Trasnfer Protocol
viii.Carrier Sense Multiple Access/Collission Avoidance

ix.Secure Socket Layer
x.Transport Layer security

40. Ans. The protocol used to copy a file from/to a remotely located server is File Transfer Protocol (FTP).
41. Ans. MAC address (media access control) refers to the physical address assigned by NIC manufacturers. A MAC address is a 6 byte address with each byte separated by a colon eg, 10:B5:03:63:2E:FC . The first three bytes are manufacturer id and the last three bytes are the card no.
    Every machine on a TCP/IP network has a unique identifying number called an IP address. IP addresses are needed so that different networks can communicate with each other.
    MAC address is assigned by the manufacturer, while IP address is assigned by the network administrator or internet service provider (ISP).
42. Ans. i.any student or faculty can login to any computer on network and can access their work from file server.
    ii.there will be network security like password protection which will help to prevent unauthorized users in entering the network.
43. Ans. Every machine on a TCP/IP network has a unique identifying number called an IP address. IP addresses are needed so that different networks can communicate with each other. An IP address in dotted decimal form: 216.27.61.137
44. Ans. Network formed is personal area network (PAN) and communication media is Bluetooth.
45. Ans. Star topology requires more cable length than bus topology because in star topology all nodes are directly connected with central node whereas in bus topology there is a single length wire which connects all the nodes together.
46. Ans. Communication medium should be optical fibre and type of network is LAN (local area network).
47. Ans. Seema should use repeater as network device and amit should use gateway as network device.
48. Ans. IP address and domain name are two different identities but their roles are same to the world. They are connected and supporting each other, the IP address needs the domain name to function properly. So does the domain name, it cannot go online without connecting IP address.
49. Ans. Type of network that will be formed: Wide Area Network (WAN). Transmission media to be used: satellite.
50. Ans. Not communication media: Node
    Wired media: optical fibre cable
    Wireless media: Microwaves, Radio waves
51. Ans. i. GSM: Global System for Mobile Communications.
    ii. IP: Internet Protocol
    iii.TCP/IP: Transmission Control Protocol/Internet Protocol
52. Ans. i. Firewall. ii. Switch
53. Ans. Firewall.
    ii.bluetooth or infrared whichever is supported by phone.
54. Ans. Star topology is the network topology in which each node is connected independently using a switch.
55. Ans. Odd one: Bluetooth.
    Reason: Bluetooth is a wireless/unguided communication media while others are wired/guided communication media.
56. Ans. Valid IP addresses: (i) , (ii) , (iii)

Invalid IP address: (iv) 198.-1.1.1 because an IP address is a group of four bytes; each of which can be a number from 0 to 255.