Past Papers Topical
2.1 Communication (Network including internet)

9618/11/M/J/21

4 Melinda and her friends set up a peer-to-peer network between their computers to share data.
(a) Describe the key features of a peer-to-peer network.
.....
.....
.....
..... [2]
(b) Describe **two** drawbacks to Melinda and her friends of using a peer-to-peer network.
1 .....
.....
.....
2 .....
.....
.....[4]

(c) Melinda connects her laptop to the internet through her router.

(i) Tick (✓) **one** box in each row to identify whether the task is performed by the router or not.

Task	Performed by router	Not performed by router
Receives packets from devices		
Finds the IP address of a Uniform Resource Locator (URL)		
Directs each packet to all devices attached to it		
Stores the IP and/or MAC address of all devices attached to it		

[2]

(ii) Melinda mainly uses the internet to watch films and play computer games.

Tick (✓) **one** box to identify whether Melinda should connect to the router using a wired or wireless network **and** justify your choice.

Wired	
Wireless	

Justification .....
.....
.....
.....
.....
..... [3]

(d) Melinda sends emails from her webmail account (email account accessed through a website).
Explain whether Melinda is using the internet, or the World Wide Web (WWW), or both.
.....
.....
.....
..... [3]

9618/12/M/J/21
5 (c) Seth accesses both software and data using cloud computing.
(i) Give **two** benefits of storing data using cloud computing.
1 .....
.....
2 .....
.....[2]
(ii) Give **two** drawbacks of Seth using cloud computing.
1 .....
.....
2 .....
.....[2]

(d) Draw **one** line from each term to its **most appropriate** description.

Term	Description
	It is only visible to devices within the Local Area Network (LAN)
Public IP address	It increments by 1 each time the device connects to the internet
Private IP address	A new one is reallocated each time a device connects to the internet
Dynamic IP address	It can only be allocated to a router
Static IP address	It is visible to any device on the internet
	It does not change each time a device connects to the internet

[4]

Answers
9618/11/M/J/21

Question	Answer	Marks
4(a)	**1 mark** per bullet point to **max 2** • All computers are of equal status • Each computer provides access to resources and data // data is distributed • Computers can communicate and share resources • Each computer is responsible for its own security	**2**
4(b)	**1 mark** per bullet point to **max 2** per drawback • Reduced security // no central management of security • … only as secure as the weakest computer on the network • … each computer is at risk from viruses from other computers • No central management of backup • … if the data from one computer is not backed up it is lost to all of them • No central management of files/software • … consistency may be difficult to maintain • … each computer may have different software from the others • Individual computers may respond slower • … because they are being accessed by other computers • In order to share files etc. all the computers involved need to be switched on	**4**
4(c)(i)	**1 mark** for first 2 ticks, **1 mark** for last 2 (shaded)	**2**

Task	Performed by router	Not performed by router
Receives packets from devices	✓	
Finds the IP address of a Uniform Resource Locator (URL)		✓
Directs each packet to all devices attached to it		✓
Stores the IP and/or MAC address of all devices attached to it	✓	

4(c)(ii)	**1 mark** per bullet point for justification up to **max 3** No mark for identification of wired/wireless Wired • Faster connection // higher bandwidth • …. needed as she is downloading/streaming large files • … less time waiting / less latency / fewer delays • **More** reliable / stable connection • … is less susceptible to issues with distance/walls/interference • **More** secure Wireless • Freedom of movement • … can move between different rooms with a mobile device and still receive/transmit data • … no need of a physical connection • Easily expanded if friends want to access the same network • Less cabling / expertise is needed • ... making the initial setup less expensive	**3**
4(d)	**1 mark** for identifying that she is using both. **1 mark** per bullet point for justification • using internet because sending data on **the infrastructure** • using WWW because accessing a **website** (that is stored on a web server operated by the webmail) that is part of the WWW	**3**

Answers
9618/12/M/J/21

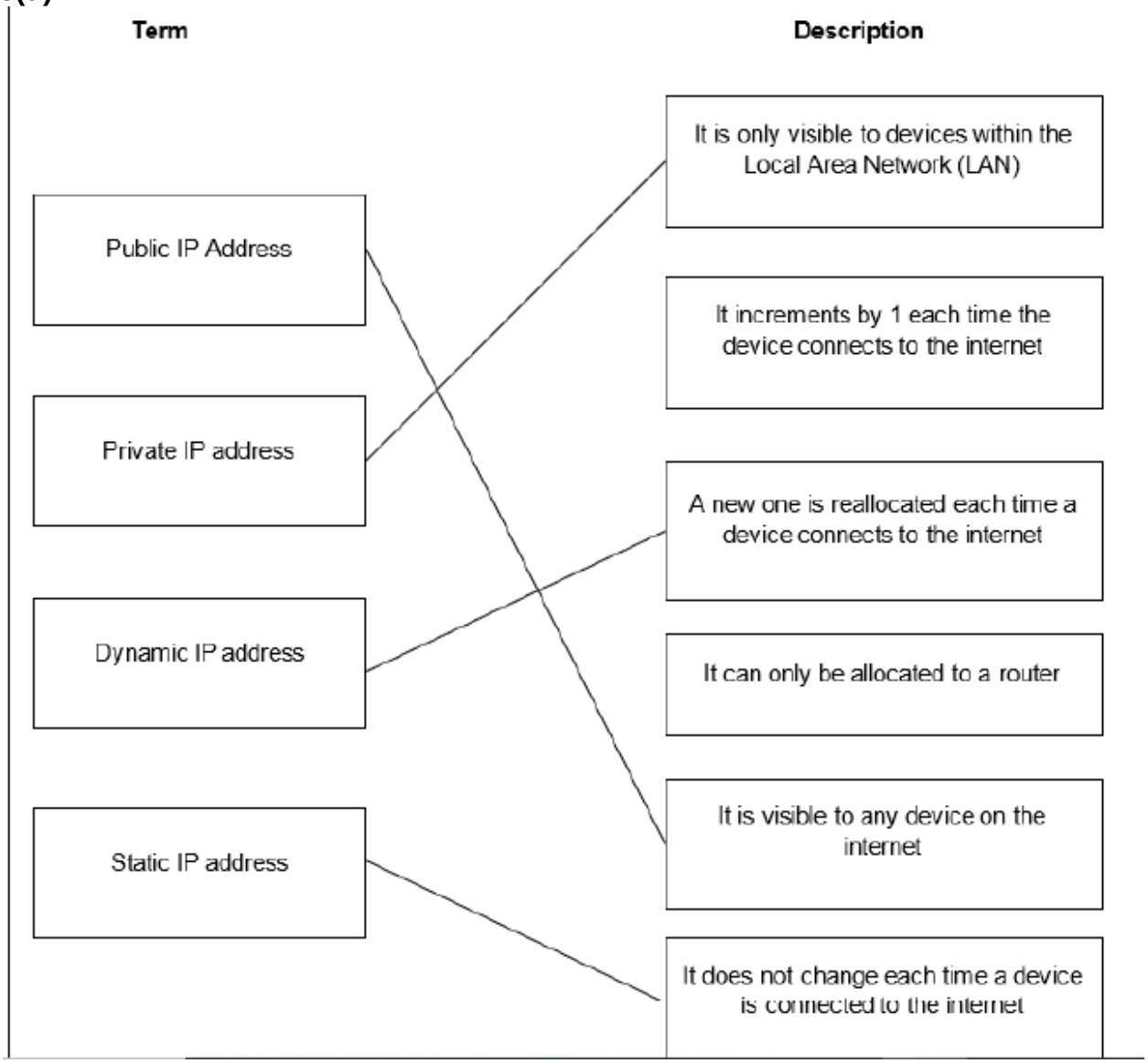
BENEFITS

5(c)(i)	**1 mark** per bullet point to **max 2** • Cloud storage can be free (for small quantities) • No need for separate (high capacity) storage devices // saves storage on existing devices • Can access data from any computer **with internet access** • Most cloud data services will have in-built backup/disaster recovery • Security could be better • Can easily increase capacity • Data can be easily shared	**2**

DRAWBACKS

5(c)(ii)	**1 mark** per bullet point to **max 2**: • Can only access (the cloud) with internet access • Security may not be strong // no control over security • There may not be any backups // no control over backups • It can take a long time to **upload/download** the data • It can be more expensive in the long term • There could be a limit to the amount of storage unless paid for • There could be compatibility/access issues • There could be issues with the company offering cloud services	**2**

5(d)


Term
Description
Public IP Address
Private IP address
Dynamic IP address
Static IP address
It is only visible to devices within the Local Area Network (LAN)
It increments by 1 each time the device connects to the internet
A new one is reallocated each time a device connects to the internet
It can only be allocated to a router
It is visible to any device on the internet
It does not change each time a device is connected to the internet

[4]

9608/12/15

5 (a) Telephone calls can be made by using:

- conventional telephones (using the Public Service Telephone Network (PSTN) system) over a wired network
- a computer, equipped with speakers and microphone, connected to the Internet

Put a tick (✓) in the correct column to match each description to the appropriate communication method.

Description	Conventional telephone using PSTN	Internet-based system
connection only in use whilst sound is being transmitted		
dedicated channel used between two points for the duration of the call		
connection maintained throughout the telephone call		
encoding schemes and compression technology used		
lines remain active even during a power outage		

[5]

(b) Distinguish between the Internet and the World Wide Web (WWW).

.....
.....
.....
.....
.....
.....[3]

(c) Name the hardware device that is being described:

(i) A device that transfers data from one network to another in an intelligent way. It has the task of forwarding data packets to their destination by the most efficient route.

.....[1]

(ii) A device used between two dissimilar LANs. The device is required to convert data packets from one protocol to another.

.....[1]

(iii) A device or software that provides a specific function for computers using a network. The most common examples handle printing, file storage and the delivery of web pages.

.....[1]

Answers
9608/12/15

5 (a)

Description	Conventional telephone using PSTN	Internet-based system
connection only in use whilst sound is being transmitted		✓
dedicated channel used between two points for the duration of the call	✓	
connection maintained throughout the telephone call	✓	
encoding schemes and compression technology used		✓
lines remain active even during a power outage	✓	

[5]

(b) **maximum** of **two marks** for Internet references and **maximum** of **two marks** for world wide web references

Internet

- massive network of networks/interconnected network of computer devices
- Internet stands for Interconnected Networks
- uses TCP/IP protocol

World Wide Web (www)

- is a collection of (multimedia) web pages/documents
- ...stored on websites
- http/protocols used to transmit data
- web pages are written in HTML
- URLs specify the location of the web pages
- web documents are accessed using browsers **[3]**

(c)

(i) router [1]
(ii) gateway [1]
(iii) server [1]

9608/33/M/J/15

2 (a) Four descriptions and three types of local area network (LAN) are shown below.
Draw a line to connect each description to the type of LAN it applies to.

Description	Type of LAN
Any packet the listening computer receives may be part of a message for itself	Bus with terminators at each end
Connection provided through an access point	Star
A process for handling collisions has to be implemented	Wireless
Listening computer only receives packets that are addressed to itself	

[4]

(b) A user downloads a file using the FTP protocol.
Explain the function played by each of the following:
(i) Server

.....

.....

.....[2]

(ii) Command

.....

.....

.....[2]

(iii) Anonymous

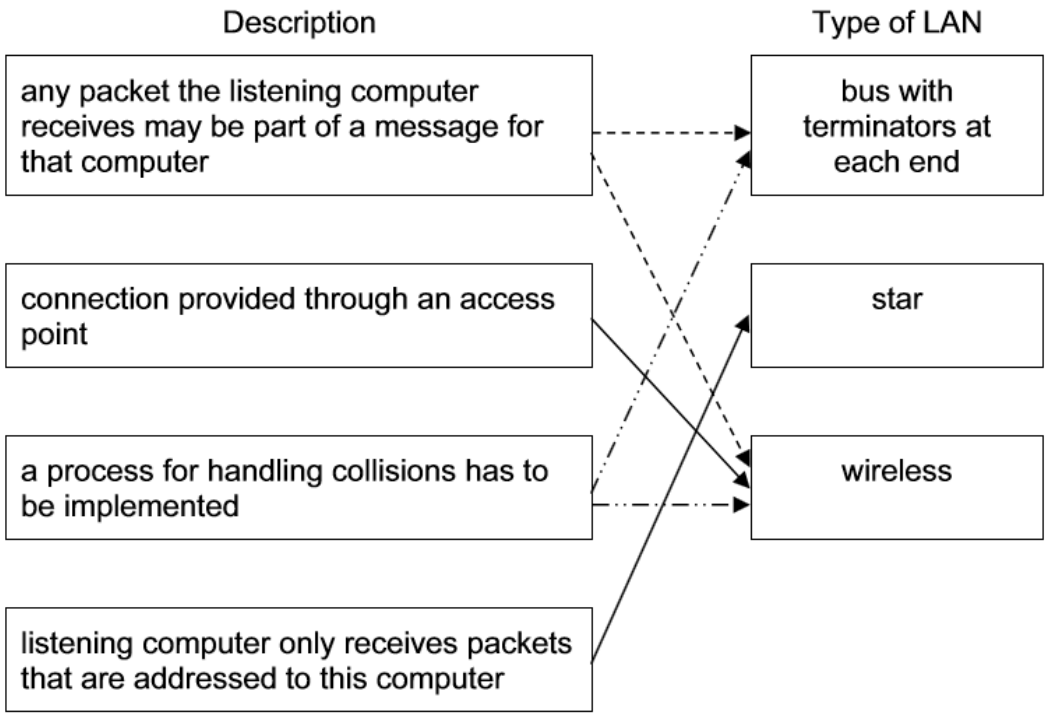
.....

.....

.....[2]

Answers

2 (a)



1 mark for correct arrow(s) from each description

(b)

(i) Server: central computer stores files that are to be downloaded

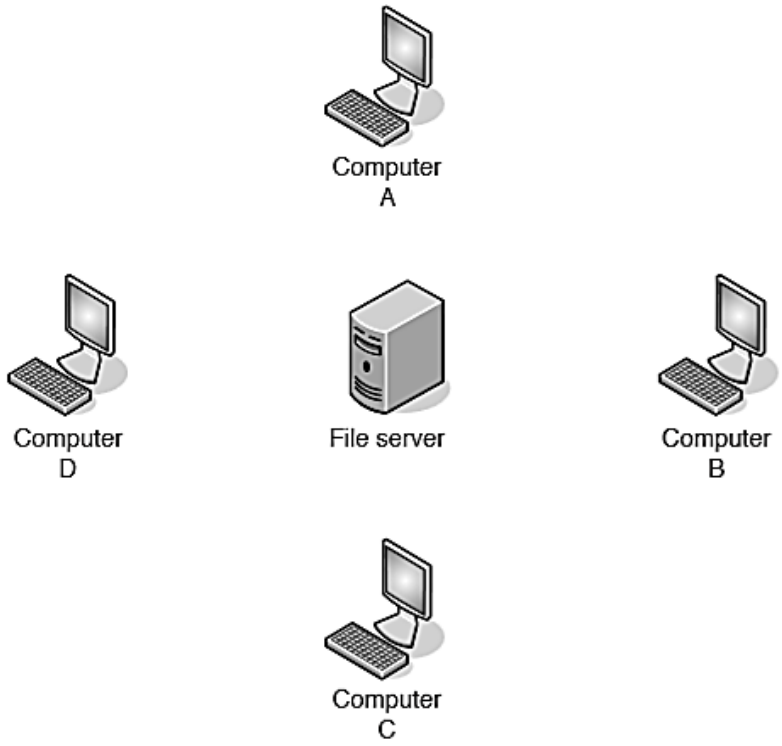
(ii) Command: user can send action/instruction (or by example, e.g. change directory) that are carried out on server

(iii) Anonymous: allows user to access files user does not need to identify themselves to server

9608/32/M/J/16

1 A Local Area Network (LAN) consists of four computers and one server. The LAN uses a bus topology.

(a) Complete the diagram below to show how the computers and the File server could be connected.



[2]

(b) Computer C sends a data packet to Computer A.

Three statements are given below.

Tick (✓) to show whether each statement is true or false.

Statement	True	False
Computer C uses the IP address of Computer A to indicate that the packet is for Computer A.		
Computer B can read the packet sent from Computer C to Computer A.		
The File server routes the packet to Computer A.		

[3]

(c) Computer A starts transmitting a packet to Computer C. At exactly the same time, the File server starts transmitting a packet to Computer D. This causes a problem.

(i) State the name given to this problem.

.....

.....[1]

(ii) Give three steps taken by both Computer A and the File server to allow them to transmit their packets successfully.

Step 1

.....

.....

Step 2

.....

.....

Step 3

.....

.....[3]

(d) Adding a switch to the LAN changes its topology. Explain how the use of a switch removes the problem identified in part **(c)(i).**

.....

.....

.....

.....

.....

.....

.....

.....[4]

9608/32/M/J/16

<table>
<tr><th>Question</th><th>Answer</th><th>Marks</th></tr>
<tr><td>1 (a)</td><td>Single line joining all four computers and file server
One “terminator” at each end</td><td>1
1</td></tr>
<tr><td>(b)</td><td><table><tr><th>Statement</th><th>True</th><th>False</th></tr><tr><td>Computer C uses the IP address of Computer A to indicate that the packet is for Computer A.</td><td>✓</td><td></td></tr><tr><td>Computer B can read the packet sent from Computer C to Computer A.</td><td>✓</td><td></td></tr><tr><td>The File server routes the packet to Computer A.</td><td></td><td>✓</td></tr></table></td><td>1
1
1</td></tr>
<tr><td>(c) (i)</td><td>Collision</td><td>1</td></tr>
<tr><td>(ii)</td><td>Both stop transmitting
Each uses a random time
Wait for time period
Check for bus status
Attempt to re-transmit</td><td>1
1
1
1
1
Max 3</td></tr>
<tr><td>(d)</td><td>Star topology created
A switch has a number of ports
Each connects to a single device (using a dedicated cable)
Switch provides direct transmission/path from device to device
Collisions are no longer possible
There are dedicated links from Computer A to Computer C AND from the Server to Computer D</td><td>1
1
1
1
1
1
Max 4</td></tr>
</table>

9608/31/M/J/17

5 (a) A web browser is used to request and display a page stored on an internet web server. Explain how each of the following items is used in this event. (i) Packet:

.....

.....

.....

.....[2]

(ii) Router:

.....

.....

.....

.....[2]

(iii) TCP/IP:

.....

.....

.....

.....[2]

(b) The Internet can be used for video conferencing. Data can be transmitted over the Internet using either packet switching or circuit switching. (i) State two problems that could arise if video conferencing were to use packet switching.

Problem 1

.....

.....

Problem 2

.....

.....[2]

(ii) Explain what is meant by circuit switching.

.....

.....

.....

.....[2]

(iii) Explain how the use of circuit switching overcomes the problems you have identified in part (i).

.....

.....

.....

.....

.....

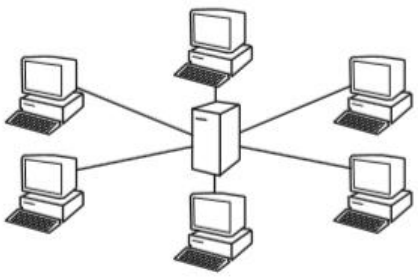
.....[3]

9608/31/M/J/17

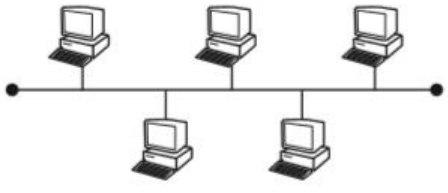
Question	Answer	Marks
5(a)(i)	Packet: Both web page and web page request are split into packets 1 Each packet is sent individually from device to device 1	2
5(a)(ii)	Router: Transmit packets Contain connections to many other routers When packets arrive at router, router decides where next to send packet 1 mark for any valid point	Max 2
5(a)(iii)	TCP/IP: Is the protocol 1 Rules for communication between web server and browser 1	2
5(b)(i)	**Two** from: Picture and sound not synchronised 1 Interruptions // video not continuous 1 Can be degraded by other competing traffic 1	Max 2
5(b)(ii)	Dedicated communications channel between the two communicating devices 1 Established prior to start of communication // removal of links at end of communication 1	2
5(b)(iii)	In packet switching, packets can take different routes and may not arrive in order Will arrive in order (only one route) As packets can take many different routes / share paths with others can be delayed Dedicated circuit has full bandwidth No loss of synch 1 mark for any valid point	Max 3

9608/31/M/J/18

3 Star and bus are two types of topology that can be used in a Local Area Network (LAN).



Star topology



Bus topology

(a) (i) State one benefit and one drawback of the star topology. Benefit

.....

.....

Drawback .....

.....[2]

(ii) State one benefit and one drawback of the bus topology. Benefit

.....

.....

Drawback .....

.....[2]

(b) The sequence of steps 1 to 7 describes what happens when the LAN transmits data from Computer X to Computer Y using circuit switching. Four statements (4 to 7) are missing from the sequence.

A	Computer X sends the data.
B	The sender signals node to deallocate resources.
C	Computer Y sends a receipt signal.
D	If available, Computer X sets up path between nodes.

Write one letter (A to D) in the appropriate space to complete the sequence.

1 Computer X sends a connection request to Computer Y.

2 Computer Y sends ready or busy signal.

3 If busy, Computer X waits and then resends the connection request to Computer Y.

4 ……

5 ……

6 ……

7 …… [3]

9608/31/M/J/18
Answers

Question	Answer	Marks
3(a)(i)	**1** mark per bullet, max **1** benefit, max **1** drawback Benefits • Signals only go to destination//secure • Easy to connect/remove nodes or devices/trouble shoot. • Centralised management helps in monitoring the network. • Failure of one node or link doesn't affect the rest of network. • Performance does not degenerate under load • Connections may use different protocols • Fewer collisions Drawbacks • If central device fails then whole network goes down. • Performance is dependent on capacity of central device.	**2**
3(a)(ii)	**1** mark per bullet, max **1** benefit, max **1** drawback Benefits • Easier to set-up/extend. • Less cable required Drawbacks • If the main cable breaks, network performance badly degraded. • Difficult to detect and troubleshoot fault at an individual station. • Efficiency reduces as the number of devices connected to it increases. • Collisions // not suitable for networks with heavy traffic. • Security is lower (because several computers receive the sent signal from the source.)	**2**

Question	Answer	Marks
3(b)	1 mark for each correct pair of letters in the right order max 3	3

1	Computer X sends a connection request to Computer Y.
2	Computer Y sends ready or busy signal.
3	If busy, Computer X waits and then resends the connection request to Computer Y.
4	D
5	A
6	C
7	B