Unit 1 · Computer Network and Communication

WORKSHEET

Full marks 33

Name _____ Class _____ Roll no. ____ Date _____ Marks _____ / 33

1 Key words [4]

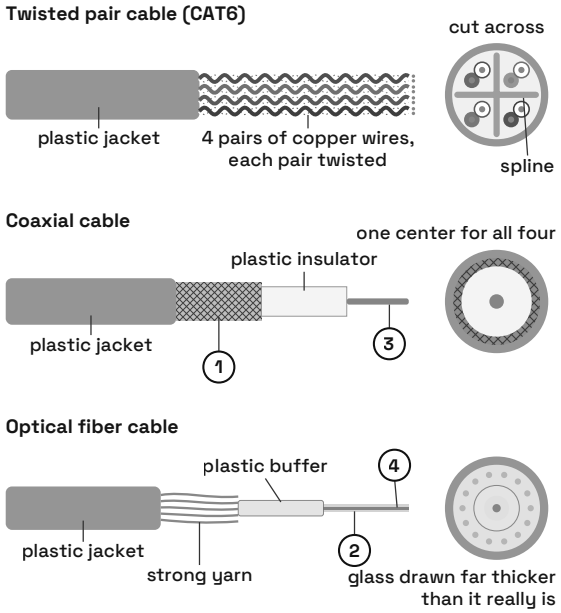
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

bandwidth	full duplex	hub	latency	packets	protocol	repeater	simplex	throughput	topology

Data sent over a network is cut into small pieces called _____. The most data a connection can carry each second is its _____, while the data that really gets through each second is its _____. The delay before a reply starts to come back is called _____. A set of rules that computers follow to communicate is a _____, and the pattern in which the computers of a network are joined is its _____. A _____ takes in a weak signal and sends it on at full strength. A phone call, in which both people can talk and hear at once, is _____.

2 Label the diagram [2]

The diagram shows two kinds of network cable, stripped back in steps. Write the name of the part in place of 1 to 4. Each carries 0.5 mark.



1. _____ 2. _____

3. _____ 4. _____

3 Multiple choice [5]

Choose the correct option for each of the following questions.

i. Which kind of broadband reaches a home as flashes of light? [1]

a. DSL **b.** cable
c. fiber optic **d.** satellite

ii. Which device strengthens weak network signals for long distances? [1]

a. switch **b.** router
c. repeater **d.** bridge

iii. Two friends use walkie-talkies on a trek. What mode is that? [1]

a. simplex **b.** half duplex
c. full duplex **d.** no mode: walkie-talkies are radios

iv. Twenty computers in a lab are joined by one box. When PC 3 sends a file to the printer, only the printer receives it. What is the box? [1]

a. a hub **b.** a switch
c. a repeater **d.** a modem

v. A small travel agency has four computers and one printer, and no IT staff. Which architecture suits it best? [1]

a. client–server, with a dedicated server **b.** peer-to-peer
c. a WAN **d.** a bus topology

4 Match the columns [2]

Match each device with its job. One job in the right column is not needed.

Column A		Column B
1. hub	☐	**a.** joins different networks and chooses the best path by IP address
2. switch	☐	**b.** changes electrical signals from copper into light for a fiber
3. router	☐	**c.** copies whatever arrives to every other port
4. media converter	☐	**d.** turns a domain name into an IP address
		e. sends each message only to the port it is meant for

5 True or false [3]

Write True or False after each sentence.

i. In a star topology, a broken cable cuts off only the computer on that cable. ☐

ii. An IPv4 address is 128 bits long. ☐

iii. Throughput can never be more than the bandwidth. ☐

iv. SMTP is the protocol a browser uses to ask a web server for pages. ☐

v. An intranet can be used only by the authorized people of its own organization. ☐

vi. Bluetooth is meant for connections over many kilometers. ☐

6 Short answers [8]

Write short answers to the following questions.

a. Write any two differences between bandwidth and throughput. [2]

b. Write any two differences between guided and unguided media, with one example of each. [2]

c. A school's library is in a building 300 m from the computer lab. The school wants to join the library's computers to the lab's network. Which cable should it use between the buildings, and which device is needed where that cable meets the lab's copper cables? Give a reason for the cable. [2]

d. Shorten the IPv6 address 2001:0db8:0000:0000:0000:ff00:0042:8329 as far as the rules allow. [2]

7 Numerical problem [3]

Solve the following problem. Show your working.

A family's plan has a bandwidth of 50 Mbps. A student downloads a 900 MB video lesson.

i. While nothing else uses the line, the throughput is 20 Mbps. How long does the download take, at best?

ii. Later, five devices share the line equally. What throughput can each get, at most, and how long would the same download then take?

Answer:

8 Long answer [4]

Write a long answer to the following question.

Design a simple layout for a school computer lab network using at least one switch, 10 computers and internet access. Explain your design choices and how the devices would communicate with each other.

9 Think [2]

Think, then answer.

A school lab's 30 computers are joined in a star to one switch. Which single device, if it fails, stops the whole lab? Suggest one way to keep the lab working if it does.

10 Activity: Ask the network (not marked)

At a computer with Windows, open the Command Prompt and type each command. (Or use the activity **Four commands to ask the network** on the unit's page, the QR code.) Fill in the table.

Command	What I looked for	What I found
`ipconfig`	the IPv4 address: private or public?	
`ipconfig`	the subnet mask and the default gateway	
`ping google.com`	the time of each reply, and the loss	
`tracert google.com`	how many hops to get there	
`nslookup google.com`	the IP addresses for that name	