Unit 6 · Networks and the Internet

WORKSHEET

Full marks 34

Name _____ Class _____ Roll no. ____ Date _____ Marks _____ / 34

1 Key words [4]

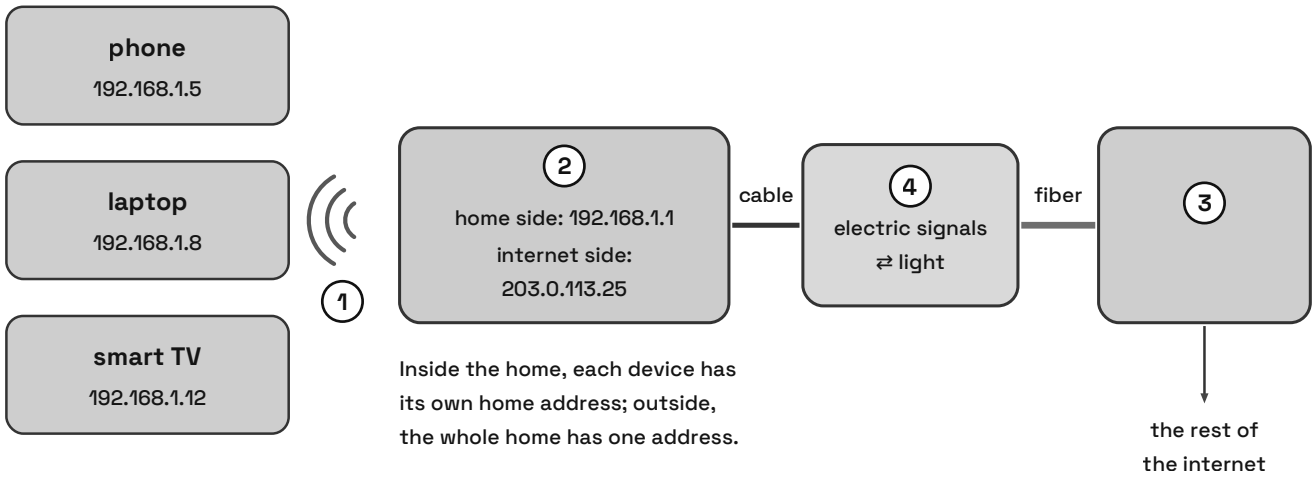
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

header	hop	hotspot	IP address	packets	reassembling	resilience	router	routing table	switch

The internet cuts every message into small pieces called _____. The label on each piece, with the address it is going to, the address it came from and its number, is its _____. Putting the pieces back in order at the other end is called _____ the message. The number that identifies a device on a network, like 192.168.1.4, is its _____. A device that joins networks and passes each packet one step nearer its address is a _____, and the list it keeps of which link leads towards which addresses is its _____. Each step from one router to the next is a _____. The ability to keep working when parts fail is called _____.

2 Label the diagram [2]

The diagram shows a home network. Write what belongs 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. What does a router read in each packet it passes on? [1]

a. the whole message, to check it is polite **b.** the address it is going to

c. the password of the sender **d.** the name of the app that sent it

ii. Which of these could be an IP address? **[1]**

a. 192.168.300.4 **b.** 192.168.1.4

c. moecdc.gov.np **d.** 9841-123456

iii. A packet from Kathmandu to a server abroad passes through 15 routers. What is each step from one router to the next called? **[1]**

a. a link **b.** a hop

c. a header **d.** a hotspot

iv. Why did a second link to the world, through China, make Nepal's internet more resilient? **[1]**

a. China's internet is faster than India's.

b. It replaced the links through India.

c. If the links through India were cut, the internet could still reach Nepal by another way.

d. It made data packs cheaper.

v. Rita's 2 GB pack runs out in three days, though she mostly just chats. Which is the most likely reason? **[1]**

a. Her chat messages are too long.

b. Videos playing by themselves in her apps, or updates and backups running over mobile data

c. Her phone's screen is too bright.

d. Her Wi-Fi password is too short.

4 True or false **[3]**

Write True or False after each sentence.

i. A router keeps no copy of the packets it passes on. ☐

ii. All the packets of a message must go by the same way. ☐

iii. Each of the four numbers in an address like 203.0.113.25 is between 0 and 255. ☐

iv. Three phones on one home Wi-Fi have three different addresses on the internet. ☐

v. A phone's GPS can find where it is with mobile data switched off. ☐

vi. A router's Wi-Fi password and its admin password are the same thing. ☐

5 Short answers **[7]**

Write short answers to the following questions.

a. Name the three things a packet's header carries. A message's four packets arrive in the order 3, 1, 4, 2. How does the receiving phone put the message back together? What happens if one number never arrives? **[3]**

b. Your home has three phones and a laptop on one Wi-Fi. How many addresses does the home have on the internet? How does the router know which device each incoming page belongs to? **[2]**

c. What is the job of: i. a router, ii. a server, iii. a fiber box, iv. a mobile tower? **[2]**

6 Calculations [7]

Show your working.

a. Anisha sends a photo of 3 MB. Each packet carries about 1,460 bytes of the photo. About how many packets is that? (1 MB = 1,024 × 1,024 bytes.) **[2]**

Answer:

b. Light in optical fiber travels about 200,000 km a second. How long does it take to cross: i. a 30 km cable from Kathmandu to Dhulikhel and back? ii. a 9,000 km cable under the sea? **[2]**

Answer:

c. Kabita has a 3 GB pack for 30 days. She makes a 15-minute video call every day, at about 6 MB a minute. How much data is left each day for videos? How many minutes of medium-quality video (12 MB a minute) is that? (1 GB = 1,024 MB.) **[3]**

Answer:

7 Long answer [4]

Write a long answer to the following question.

On a stormy evening, the fiber cable to Bimal's home is cut by a falling branch. Which of these still work, and which don't? Explain. i. Bimal's phone on Wi-Fi; ii. Bimal's phone on mobile data; iii. the internet in the rest of his town; iv. a message from Bimal's sister in Kathmandu to their cousin in Pokhara.

8 Think [2]

Think, then answer.

Until 2018, Nepal had load-shedding: the electricity was switched off for many hours a day. During load-shedding, many people found that their home Wi-Fi stopped working, but mobile data on their phones kept working. Why?

9 Activity: Which apps use your data? (not marked)

You need a phone, yours or a family member's (ask first). Open the phone's Settings and find mobile data usage. Write down the five apps that used the most data this month, with how much each used. Then compare with a classmate.

	App	Data used this month	Do you open it often?
1			
2			
3			
4			
5			