Unit 9 · The Future of Computing

WORKSHEET

Full marks 28

Name _____ Class _____ Roll no. ____ Date _____ Marks _____ / 28

1 Key words [4]

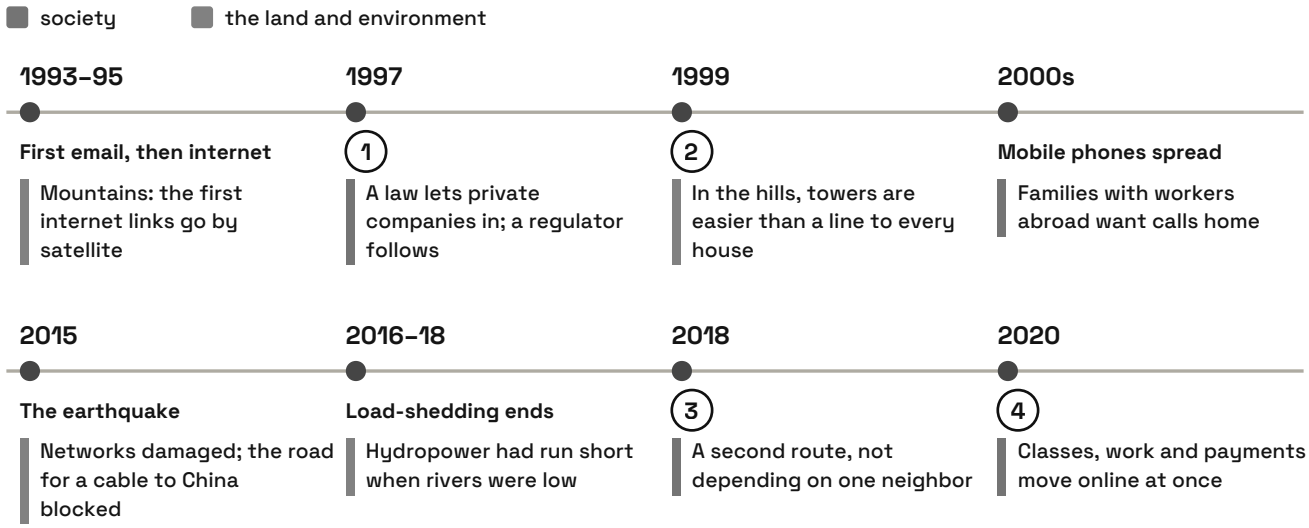
Fill in the blanks with words from the box. Two words in the box are not needed. Each blank carries 0.5 mark.

emerging technology	**established technology**	**geostationary orbit**	**hundi**	**portfolio**
post-quantum encryption	**qubits**	**regulatory sandbox**	**sunset clause**	**technology-neutral**

A technology that is new or changing fast, whose uses and effects aren't yet well known, is an _____; one that is settled, cheap and well studied is an _____. A satellite 35,786 km above the equator, which seems to hang still in the sky, is in a _____. A quantum computer works with _____. Encryption that no known quantum method can break is _____. A scheme that lets new products be tried with real customers, under a regulator's close watch, before the full rules are decided is a _____. A part of a law saying that the rule ends on a date unless it is renewed is a _____. A rule written about what something does, not about one company or product, is _____.

2 Label the diagram [2]

The diagram shows the internet in Nepal from 1993 to 2020. Write what happened 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. Why does a signal through a geostationary satellite always take at least about half a second there and back, however good the equipment? [1]

a. The satellite has to wait for its turn in orbit.

b. The satellite is so far away that light needs that long to travel up and down twice.

c. Satellites process data slowly.

d. Radio waves are slower than light.

ii. A new app is free, but works only in English and needs a fast connection. What kind of gap is this most likely to cause? [1]

a. none, because it is free

b. students in towns with good English and fast internet gain much more than others, so the gap between them grows

c. only a gap between rich and poor countries

d. only a gap between young and old

iii. Which of these is an **environmental** factor in the history of the internet in Nepal? [1]

a. The Telecommunications Act of 1997

b. Families with members working abroad

c. Mountains that made cables slow and costly to lay, so satellites came first

d. Competition between companies

iv. A signed 32-bit counter of seconds since 1970 overflows in January 2038. What does the computer then think the date is? [1]

a. 1 January 2038 **b.** 1 January 1970

c. a date in December 1901 **d.** it stops at 19 January 2038 forever

v. A message on Telegram offers Rs 4,000 a day for rating hotels online, after a Rs 2,000 registration fee. What should you do? [1]

a. Pay the fee, because the pay is good.

b. Ask for a smaller fee.

c. Don't pay or reply; it is a scam. Tell someone, and report it to the Cyber Bureau if you lost money.

d. Share it with friends so they can earn too.

4 How long does the signal take? [3]

Work it out in the space below. Radio waves travel at about 300,000 km every second.

A message goes from Kathmandu up to a satellite and down to a ground station, and the answer comes back the same way. Work out the least time this can take through: i. a geostationary satellite, 35,786 km up; ii. a low Earth orbit satellite, 550 km up. Why does the difference matter for a video call?

Answer: _____

5 What does it print? [4]

Many old programs stored a year as two digits. Write exactly what this program prints, in the box under it. Then answer ii.

```
born = [75, 88, 92]   # years stored as two digits
now = 99
for b in born:
    print(b, now - b)
now = 0               # the year 2000
for b in born:
    print(b, now - b)
```

OUTPUT

ii. What went wrong in the year 2000, and how should the years have been stored?

6 Which kind of gap? [2]

Write A (inequity in access) or O (inequity in outcomes) after each case. Each carries 0.5 mark.

i. A village has no mobile signal, so its students can't open the online classes at all.
ii. Two students use the same science app; one reads its English easily, the other understands little of it.
iii. A tutor app costs more each month than many families can pay.
iv. Students who share a parent's phone get a few minutes with the app each evening, while others use it for hours.

7 Short answers [6]

Write short answers to the following questions.

a. What is a **regulatory sandbox**, and how does it help with an emerging technology? What is a sunset clause? [3]

b. Give the benefits, risks and long-term effects of a town's shops accepting only digital payments. **[3]**

8 Think **[2]**

Think, then answer.

In 2026 the biggest company running low-orbit satellite internet asked Nepal to change its rules so that it could own all of its business here. The minister said a law should not be changed for one company. Was he right? How could a rule be written for low-orbit satellite internet in general instead?

9 Activity: My plan (not marked)

On your own, write your plan for after Grade 10 in the table. Keep it, and read it again at the end of Grade 11.

Part of the plan	My answer
What I enjoy and am good at in computing	
Where I might want to work (two or three ideas)	
Computing skills I have, with evidence	
Skills I need next, and where I will learn them	
My next three steps, each with a date	