Unit 3 · Growth and Depreciation

WORKSHEET

Full marks 33

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

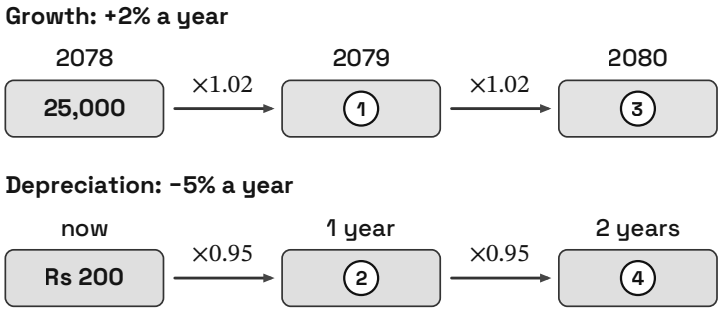
1 Key words [3]

Match each word or formula in Column A with its meaning in Column B. Write the letter in the box. One meaning in Column B is not needed. Each match carries 0.5 mark.

Column A		Column B
1. growth rate	☐	**a.** the fall in a thing's value as it is used and ages
2. depreciation	☐	**b.** people moving to a place from somewhere else
3. depreciated amount	☐	**c.** the percentage of itself a population or price gains each year
4. $P(1 + R/100)^T$	☐	**d.** the value a thing has lost, $V_0 - V_T$
5. $V_0(1 - R/100)^T$	☐	**e.** the same amount added to a population every year
6. in-migration	☐	**f.** a value after T years of depreciation
		g. a population after T years of growth

2 Fill the diagram [2]

The drawing shows growth of 2% a year and depreciation of 5% a year as multiplication. Write the number that belongs in each numbered box. 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 number is a value multiplied by each year when it depreciates by 15% a year? [1]

a. 0.15 **b.** 1.15

c. 0.85 **d.** 15

ii. A town of 20,000 grows by 10% a year. What is its population after 2 years? [1]

a. 22,000 **b.** 24,000
c. 24,200 **d.** 40,000

iii. A price rises by 20% and then falls by 20%. Compared with the start it is [1]

a. the same **b.** 4% higher
c. 4% lower **d.** 20% lower

iv. A machine loses 10% of its value each year. In which year does it lose the most rupees? [1]

a. the first **b.** the second
c. the last **d.** every year the same

v. A population grows by 4%, then 5%, then 6% in three years. Which gives it after 3 years? [1]

a. $P \times 1.15$ **b.** $P \times 1.04 \times 1.05 \times 1.06$
c. $P \times 1.05^3$ **d.** $P \times 0.04 \times 0.05 \times 0.06$

4 Very short answers [3]

Write very short answers to the following questions.

a. Write the formula for the depreciated amount of a thing worth V_0 after T years at R% a year. [1]

b. A sack of rice cost Rs 2,000 a year ago. Its price has risen by 6%. What does it cost now? [1]

c. A motorbike is worth Rs 1,00,000 and depreciates by 20% a year. Is it worth nothing after 5 years? Give its value. [1]

5 Short answers [6]

Write short answers to the following questions.

a. Explain why a population growing at 2% a year gains more people in its tenth year than in its first. [2]

b. A phone cost Rs 50,000 and depreciates by 20% a year. Hari wrote: value after 2 years $= 50000 - 2 \times 20\%$ of $50000 = 30000$. Find his mistake and write the correct value. [2]

c. A district's population grew from 64,000 to 72,000 in 2 years. Is the yearly growth rate more or less than 6.25%? Show your working. **[2]**

6 Problems [12]

Solve the following problems. Show your working.

a. A financial institution started at the beginning of 2078 with 200 marketers. Its rule is that every group of 5 marketers adds 1 new marketer each year. How many marketers will it have at the end of 2079? **[4]**

Answer:

b. Three years ago a district had 3,75,000 people, growing by 2% a year. At the end of the second year 1,480 people moved in and 2,750 died in a natural disaster. What is its population now? **[4]**

Answer:

c. A bus owner bought a bus for Rs 16,00,000 and ran it on the Kathmandu–Baglung route for 3 years, earning only Rs 5,10,000. Its value depreciates by 5% a year, and he sells it after 3 years. Find his profit or loss. **[4]**

Answer:

7 Think [2]

Think, then answer.

A shopkeeper says: “Prices rose 10% last year and fell 10% this year, so they are back to where they were.” Is he right? Show your working with a price of Rs 500.

8 Activity: What is it worth now? (not marked)

Ask at home about three things your family bought some years ago (a phone, a TV, a motorbike, a cupboard). Find what each cost new and what it could be sold for now (ask a shop, or look on a second-hand website). Fill in the table.

	Thing 1	Thing 2	Thing 3
what it is			
price new, Rs			
years used			
value now, Rs			
yearly depreciation rate (about)			

Which lost value fastest? Why do you think so?