Unit 2 · Compound Interest

WORKSHEET

Full marks 33

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

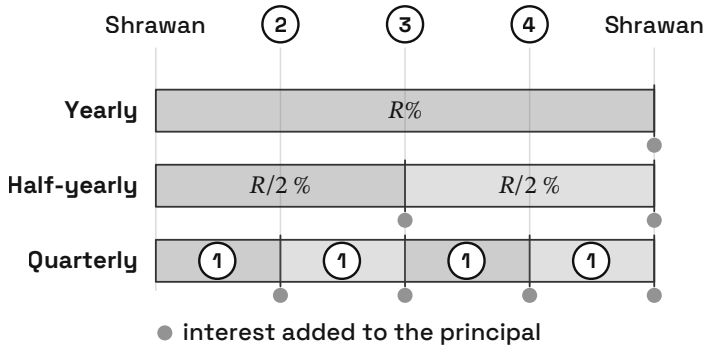
1 Key words [3]

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. principal	☐	**a.** interest worked out on the principal plus the interest already added
2. compound interest	☐	**b.** the time after which interest is added to the principal
3. compound amount	☐	**c.** the money first deposited or borrowed
4. compounding period	☐	**d.** what quarterly compounding uses in place of $R\%$ for T years
5. $\frac{R}{2}\%$ for $2T$ periods	☐	**e.** interest worked out on the first principal only, the same every year
6. $\frac{R}{4}\%$ for $4T$ periods	☐	**f.** what half-yearly compounding uses in place of $R\%$ for T years
		g. the principal and the compound interest together

2 Fill the diagram [2]

The drawing shows one year from Shrawan 1, with interest added yearly, half-yearly and quarterly. Write the month or the rate that belongs at each numbered place. 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 formula gives the compound amount when interest is added yearly? [1]

a. $P\left(1+\frac{RT}{100}\right)$

b. $P\left(1+\frac{R}{100}\right)\times T$

c. $P\left(1+\frac{R}{100}\right)^{T}$

d. $P\left[\left(1+\frac{R}{100}\right)^{T}-1\right]$

ii. Rs 10,000 is deposited at 10% a year, compounded yearly. What is the interest in the second year alone? [1]

a. Rs 1,000 **b.** Rs 1,100

c. Rs 2,100 **d.** Rs 12,100

iii. Rs 50,000 is deposited for 2 years at 12% a year, compounded quarterly. Which gives the compound amount? [1]

a. 50000×1.12^{2} **b.** 50000×1.03^{2}

c. 50000×1.03^{8} **d.** 50000×1.12^{8}

iv. A sum amounts to Rs 8,820 in 2 years and Rs 9,261 in 3 years at a yearly compound rate. What is the rate? [1]

a. 4% **b.** 5%

c. 10% **d.** 105%

v. For the same principal, rate and time (more than a year), which order is right, from least to most interest? [1]

a. simple, yearly, half-yearly, quarterly **b.** quarterly, half-yearly, yearly, simple

c. yearly, simple, half-yearly, quarterly **d.** they are all the same

4 Very short answers [3]

Write very short answers to the following questions.

a. Write the formula for the compound interest when interest is added half-yearly. [1]

b. What number is a deposit multiplied by each year at 8% a year, compounded yearly? [1]

c. The compound amount of Rs 2,000 after 1 year at a yearly compound rate is Rs 2,240. Find the rate. [1]

5 Short answers [6]

Write short answers to the following questions.

a. Explain why compound interest for 3 years is more than simple interest for 3 years at the same rate. [2]

b. Rs 20,000 is deposited for 1 year at 8% a year, interest compounded half-yearly. Ramesh wrote: $\text{CA} = 20000\left(1 + \frac{8}{200}\right)^1 = 20800$. Find his mistake and write the correct amount. [2]

c. A sum amounts to Rs 8,820 in 2 years at 5% a year, compounded yearly. Find the sum, then check your answer. [2]

6 Problems [12]

Solve the following problems. Show your working.

a. Without using the formula, find the compound interest and the compound amount on Rs 64,000 for 3 years at 6% a year. [4]

Answer:

b. Sabita deposits Rs 1,50,000 in a bank that pays 6% a year compound interest, added yearly. After 2 years 5 months: [4]

i. how much is the compound amount?

ii. how much is the compound interest?

Answer:

c. A person deposits Rs 80,000 in a cooperative for 2 years at 15% a year, compounded yearly; 5% tax is taken from the interest at the end of each year. After the first year the cooperative changes its policy and adds interest half-yearly at the same rate. After tax, by what percentage is the second year's interest more than the first year's? **[4]**

Answer: _____

7 Think **[2]**

Think, then answer.

Rs 10,000 is deposited for 2 years, compounded yearly. Asha says: "If the rate is doubled from 5% to 10%, the compound interest doubles too." Is she right? Show your working.

8 Activity: What do the banks pay? (not marked)

Find the interest rates of two banks or cooperatives near you (from a notice board, a brochure or the institution's website). Fill in the table, then work out what Rs 1,00,000 in a fixed deposit becomes after 2 years in each.

	Institution 1	Institution 2
name		
fixed deposit rate (% a year)		
interest added (yearly, half-yearly, quarterly…)		
amount after 2 years, Rs		
tax taken from the interest (%)		

Which would you choose, and why?