

MH CET LAW Basic Mathematics

Sample Paper – 6

Duration: 8 Minutes | Maximum Marks: 8

Instructions

- This paper contains **8 Multiple Choice Questions** modelled on the Basic Mathematics section of MH CET LAW (5-Year LLB).
- Questions are based on Class 10 level arithmetic: Number System, Percentages, Ratio & Proportion, Profit & Loss, Simple & Compound Interest, Time & Work, Speed & Distance.
- Each correct answer carries +1 **mark**. There is **no negative marking** for incorrect or unattempted answers.
- Only **one option** is correct per question.
- Use of calculators, mobile phones, or electronic gadgets is **strictly prohibited**.

Questions

Q1. The sum of three consecutive even integers is 78. Find the largest of the three.

- A. 24
- B. 26
- C. 28
- D. 30

Q2. A number is first increased by 25% and then decreased by 20%. What is the net percentage change in the number?

- A. 5% increase
- B. 5% decrease
- C. 2% decrease
- D. No change (0%)



Q3. A trader buys goods for Rs. 750 and sells them for Rs. 900. What is his profit percentage?

- A. 20%
- B. 16.67%
- C. 18%
- D. 25%

Q4. A sum of Rs. 8,000 is lent in two parts: Rs. 3,000 at 4% p.a. and Rs. 5,000 at 6% p.a., both for 2 years under simple interest. What is the total simple interest earned?

- A. Rs. 720
- B. Rs. 840
- C. Rs. 900
- D. Rs. 960

Q5. The monthly salaries of X and Y are in the ratio 5 : 4. If X earns Rs. 6,000 more than Y per month, what is Y's monthly salary?

- A. Rs. 18,000
- B. Rs. 20,000
- C. Rs. 24,000
- D. Rs. 30,000

Q6. A and B together can complete a task in 12 days. A alone can complete the same task in 20 days. In how many days can B alone complete the task?

- A. 20 days
- B. 24 days
- C. 25 days
- D. 30 days



Q7. A boat travels 36 km downstream in 3 hours and 24 km upstream in 4 hours. What is the speed of the boat in still water?

- A. 9 km/h
- B. 6 km/h
- C. 7.5 km/h
- D. 12 km/h

Q8. A certain principal amounts to Rs. 14,400 in 2 years at 20% per annum compounded annually. Find the principal.

- A. Rs. 9,000
- B. Rs. 10,000
- C. Rs. 11,000
- D. Rs. 12,000



Detailed Solutions

Solution to Q1

Number System / Consecutive Even Integers

Solution

Concept: Three consecutive even integers can be written as n , $n + 2$, $n + 4$. Their sum equals $3n + 6$.

Step 1 — Set up and solve the equation.

$$n + (n + 2) + (n + 4) = 78 \implies 3n + 6 = 78 \implies 3n = 72 \implies n = 24$$

Step 2 — Identify the three integers and the largest.

Integers: 24, 26, 28 Largest = 28

Verification: $24 + 26 + 28 = 78$ ✓

Why the other options are wrong:

- **A – 24:** This is the *smallest* of the three consecutive even integers, not the largest.
- **B – 26:** This is the *middle* integer.
- **D – 30:** The set 26, 28, 30 sums to $84 \neq 78$.

Answer: (C) 28

Answer: (C) [Go Back to Q1](#)

Solution to Q2

Percentage / Successive Increase Then Decrease

Solution

Concept: When a value is successively changed by $+x\%$ then $-y\%$, the net multiplier is $(1 + \frac{x}{100})(1 - \frac{y}{100})$.

Step 1 — Compute the net multiplier.

Let the original number be 100.

After a 25% increase:

$$100 \times 1.25 = 125$$

After a 20% decrease:

$$125 \times 0.80 = 100$$



Step 2 — Determine the net change.

$$\text{Net change} = 100 - 100 = 0 \implies \text{No change (0\%)}$$

Note: Using the formula directly: $\text{net\%} = 25 - 20 - \frac{25 \times 20}{100} = 5 - 5 = 0\%$.

Why the other options are wrong:

- **A – 5% increase:** Incorrectly adds the two percentages ($25 - 20 = 5$) without accounting for the compounding interaction.
- **B – 5% decrease:** Reverses the direction of option A; neither is correct.
- **C – 2% decrease:** Arises from a mis-application of the formula, perhaps using $\frac{25 \times 20}{1000}$ instead of $\frac{25 \times 20}{100}$.

Answer: (D) No change (0%)

Answer: (D) [Go Back to Q2](#)

Solution to Q3

Profit & Loss / Gain Percent

Solution

Concept: Profit % = $\frac{\text{Profit}}{\text{Cost Price}} \times 100$, where Profit = Selling Price – Cost Price.

Step 1 — Calculate the profit.

$$\text{Profit} = \text{SP} - \text{CP} = 900 - 750 = \text{Rs. } 150$$

Step 2 — Calculate profit percentage.

$$\text{Profit \%} = \frac{150}{750} \times 100 = \frac{150}{7.5} = 20\%$$

Why the other options are wrong:

- **B – 16.67%:** Computed as $\frac{150}{900} \times 100$, i.e. profit over *selling price* rather than cost price.
- **C – 18%:** Arises from a rounding or arithmetic error; $18\% \text{ of } 750 = 135 \neq 150$.
- **D – 25%:** Would require a profit of $\frac{25}{100} \times 750 = \text{Rs. } 187.50$, not Rs. 150.

Answer: (A) 20%


Answer: (A) [Go Back to Q3](#)

Solution to Q4

Simple Interest / Two Parts at Different Rates

Solution

Concept: Simple Interest: $SI = \frac{P \times R \times T}{100}$. When a sum is split into parts, compute SI on each part separately and add.

Step 1 — SI on the first part (Rs. 3,000 at 4% for 2 years).

$$SI_1 = \frac{3000 \times 4 \times 2}{100} = \frac{24000}{100} = \text{Rs. } 240$$

Step 2 — SI on the second part (Rs. 5,000 at 6% for 2 years).

$$SI_2 = \frac{5000 \times 6 \times 2}{100} = \frac{60000}{100} = \text{Rs. } 600$$

Step 3 — Total Simple Interest.

$$SI_{\text{total}} = 240 + 600 = \text{Rs. } 840$$

Why the other options are wrong:

- **A – Rs. 720:** Computed using an incorrect blended rate of 4.5% on the full Rs. 8,000 for 2 years.
- **C – Rs. 900:** Arises from using 6% on the full Rs. 8,000 ($= 8000 \times 6 \times 2/100$), ignoring the split.
- **D – Rs. 960:** Uses an inflated rate or adds an extra year incorrectly.

Answer: (B) Rs. 840

Answer: (B) [Go Back to Q4](#)

Solution to Q5

Ratio & Proportion / Salaries

Solution

Concept: If quantities are in the ratio $a : b$, let them be ak and bk for some constant k . Use the given difference to find k .

Step 1 — Express salaries in terms of k .

$$\text{Salary of X} = 5k, \quad \text{Salary of Y} = 4k$$



Step 2 — Use the given difference to find k .

$$5k - 4k = 6000 \implies k = 6000$$

Step 3 — Find Y's salary.

$$\text{Y's salary} = 4k = 4 \times 6000 = \text{Rs. } 24,000$$

Check: X earns $5 \times 6000 = \text{Rs. } 30,000$; difference $= 30000 - 24000 = \text{Rs. } 6,000 \checkmark$

Why the other options are wrong:

- **A – Rs. 18,000:** This would make X earn Rs. 22,500 (ratio 5 : 4), giving a difference of Rs. 4,500, not Rs. 6,000.
- **B – Rs. 20,000:** Implies $k = 5000$, so the difference $= k = \text{Rs. } 5,000 \neq 6,000$.
- **D – Rs. 30,000:** This is X's salary, not Y's.

Answer: (C) Rs. 24,000

Answer: (C) [Go Back to Q5](#)

Solution to Q6

Time & Work / Find One Person's Rate

Solution

Concept: If A and B together complete a task in T_{AB} days, and A alone takes T_A days, then B's rate is $\frac{1}{T_B} = \frac{1}{T_{AB}} - \frac{1}{T_A}$.

Step 1 — Write the combined and individual work rates.

$$\frac{1}{T_A} + \frac{1}{T_B} = \frac{1}{T_{AB}} \implies \frac{1}{20} + \frac{1}{T_B} = \frac{1}{12}$$

Step 2 — Solve for T_B .

$$\frac{1}{T_B} = \frac{1}{12} - \frac{1}{20} = \frac{5}{60} - \frac{3}{60} = \frac{2}{60} = \frac{1}{30}$$

$$T_B = 30 \text{ days}$$

Why the other options are wrong:

- **A – 20 days:** This is A's own time; B must be slower than the pair (who finish in 12 days together), so B's time must exceed 12 days.



- **B – 24 days:** Check: $\frac{1}{20} + \frac{1}{24} = \frac{6}{120} + \frac{5}{120} = \frac{11}{120} \neq \frac{1}{12} = \frac{10}{120}$.
- **C – 25 days:** Check: $\frac{1}{20} + \frac{1}{25} = \frac{5}{100} + \frac{4}{100} = \frac{9}{100} \neq \frac{1}{12}$.

Answer: (D) 30 days

Answer: (D) [Go Back to Q6](#)

Solution to Q7

Speed & Distance / Boat in Still Water

Solution

Concept: If u = speed of boat in still water and v = speed of current, then downstream speed = $u + v$ and upstream speed = $u - v$. Still water speed = $\frac{\text{downstream speed} + \text{upstream speed}}{2}$.

Step 1 — Find downstream and upstream speeds.

$$\text{Downstream speed} = \frac{36 \text{ km}}{3 \text{ h}} = 12 \text{ km/h}$$

$$\text{Upstream speed} = \frac{24 \text{ km}}{4 \text{ h}} = 6 \text{ km/h}$$

Step 2 — Find the speed of the boat in still water.

$$u = \frac{12 + 6}{2} = \frac{18}{2} = 9 \text{ km/h}$$

Also: Current speed $v = \frac{12 - 6}{2} = 3 \text{ km/h}$.

Why the other options are wrong:

- **B – 6 km/h:** This is the upstream speed (boat speed minus current), not the still-water speed.
- **C – 7.5 km/h:** The average of $36/3$ and $24/4$ would be $\frac{12+6}{2} = 9$; 7.5 might arise from averaging the distances ($\frac{36+24}{2 \times 4}$), an incorrect approach.
- **D – 12 km/h:** This is the downstream speed (boat speed plus current), not the still-water speed.

Answer: (A) 9 km/h

Answer: (A) [Go Back to Q7](#)



Solution to Q8

Compound Interest / Finding Principal

Solution

Concept: Compound Interest formula: $A = P\left(1 + \frac{R}{100}\right)^n$. To find P , rearrange: $P = \frac{A}{\left(1 + \frac{R}{100}\right)^n}$.

Step 1 — Identify the values.

$$A = \text{Rs. } 14,400, \quad R = 20\%, \quad n = 2 \text{ years}$$

Step 2 — Compute the growth factor.

$$\left(1 + \frac{20}{100}\right)^2 = (1.2)^2 = 1.44$$

Step 3 — Solve for the principal.

$$P = \frac{14400}{1.44} = \text{Rs. } 10,000$$

Verification: $10000 \times 1.44 = 14400 \checkmark$

Why the other options are wrong:

- **A – Rs. 9,000:** $9000 \times 1.44 = \text{Rs. } 12,960 \neq 14,400$.
- **C – Rs. 11,000:** $11000 \times 1.44 = \text{Rs. } 15,840 \neq 14,400$.
- **D – Rs. 12,000:** Arises from using simple interest: $A = P + P \times 0.20 \times 2 = 1.4P$; $12000 \times 1.4 = 16800 \neq 14400$.

Answer: (B) Rs. 10,000

Answer: (B) [Go Back to Q8](#)

Answer Key

Q	Ans	Q	Ans	Q	Ans	Q	Ans	Q	Ans
1	C	2	D	3	A	4	B	5	C
6	D	7	A	8	B				

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