

MH CET LAW Basic Mathematics

Sample Paper – 4

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 test 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. A number, when divided by 5, gives a remainder of 3 and, when divided by 8, gives a remainder of 7. Which of the following could be that number?

- A. 28
- B. 47
- C. 55
- D. 63

Q2. In an election between two candidates, the winner received 65% of the total valid votes and won by a margin of 4,500 votes. Find the total number of valid votes cast.

- A. 15,000
- B. 18,000
- C. 20,000
- D. 22,500



Q3. An article is marked at Rs. 2,000. Two successive discounts of 10% and 5% are applied. What is the final selling price?

- A. Rs. 1,700
- B. Rs. 1,710
- C. Rs. 1,720
- D. Rs. 1,750

Q4. A sum of money doubles itself in 8 years under simple interest. At the same rate of interest, in how many years will it triple itself?

- A. 12 years
- B. 14 years
- C. 16 years
- D. 18 years

Q5. A, B, and C invest in a business in the ratio 2 : 3 : 5. At the end of the year, the total profit is Rs. 80,000. What is C's share of the profit?

- A. Rs. 16,000
- B. Rs. 24,000
- C. Rs. 32,000
- D. Rs. 40,000

Q6. X and Y together can complete a task in 9 days. Y alone can complete the same task in 15 days. In how many days can X alone complete the task?

- A. 22.5 days
- B. 24 days
- C. 25 days
- D. 27 days



Q7. A boat's speed in still water is 12 km/h. The speed of the stream is 4 km/h. How long will it take the boat to travel 48 km downstream?

- A. 3.5 hours
- B. 3 hours
- C. 4 hours
- D. 4.5 hours

Q8. The simple interest on a sum of money at 6% per annum for 5 years is Rs. 2,250. Find the principal.

- A. Rs. 6,000
- B. Rs. 6,500
- C. Rs. 7,500
- D. Rs. 8,000



Detailed Solutions

Solution to Q1

Number System / Simultaneous Remainders

Solution

Concept: We need a number n satisfying two simultaneous modular conditions: $n \equiv 3 \pmod{5}$ and $n \equiv 7 \pmod{8}$. The strategy is to list candidates for each condition and find the common one among the options.

Step 1 — List numbers satisfying the first condition ($n \equiv 3 \pmod{5}$):

Numbers with remainder 3 when divided by 5:

3, 8, 13, 18, 23, 28, 33, 38, 43, 48, 53, 58, **63**, ...

Step 2 — List numbers satisfying the second condition ($n \equiv 7 \pmod{8}$):

Numbers with remainder 7 when divided by 8:

7, 15, 23, 31, 39, 47, 55, **63**, ...

Step 3 — Check each option against both conditions:

- **A – 28:** $28 = 5 \times 5 + 3 \checkmark$ (rem. 3), but $28 = 8 \times 3 + 4 \times$ (rem. 4, not 7). Fails second condition.
- **B – 47:** $47 = 5 \times 9 + 2 \times$ (rem. 2, not 3). Fails first condition.
- **C – 55:** $55 = 5 \times 11 + 0 \times$ (rem. 0, not 3). Fails first condition.
- **D – 63:** $63 = 5 \times 12 + 3 \checkmark$ (rem. 3) and $63 = 8 \times 7 + 7 \checkmark$ (rem. 7). Both conditions satisfied.

Final Answer: D

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

Solution to Q2

Percentage / Election Votes

Solution

Concept: In a two-candidate election, the two candidates together account for 100% of valid votes. The margin equals the difference between their vote totals. Setting up a simple linear equation gives the total votes directly.

Step 1 — Express the margin in terms of total votes:

Let total valid votes = x .

$$\text{Winner's votes} = 0.65x, \quad \text{Loser's votes} = 0.35x$$

$$\text{Margin} = 0.65x - 0.35x = 0.30x$$



Step 2 — Solve for total votes x :

$$0.30x = 4,500 \implies x = \frac{4,500}{0.30} = 15,000$$

Why other options are wrong:

- **B – 18,000:** Margin would be $0.30 \times 18,000 = 5,400 \neq 4,500$.
- **C – 20,000:** Margin would be $0.30 \times 20,000 = 6,000 \neq 4,500$.
- **D – 22,500:** Margin would be $0.30 \times 22,500 = 6,750 \neq 4,500$.

Final Answer: A

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

Solution to Q3

Profit & Loss / Successive Discounts

Solution

Concept: Successive discounts are applied sequentially — each discount is calculated on the price *after* the previous discount has been applied, not on the original marked price. Two successive discounts of $a\%$ and $b\%$ are equivalent to a single discount of $(a + b - \frac{ab}{100})\%$.

Step 1 — Apply the first discount of 10%:

$$\text{Price after first discount} = 2,000 \times \left(1 - \frac{10}{100}\right) = 2,000 \times 0.90 = \text{Rs. } 1,800$$

Step 2 — Apply the second discount of 5% on the reduced price:

$$\text{Final selling price} = 1,800 \times \left(1 - \frac{5}{100}\right) = 1,800 \times 0.95 = \text{Rs. } 1,710$$

Why other options are wrong:

- **A – Rs. 1,700:** Corresponds to a single flat 15% discount ($2000 \times 0.85 = 1700$). Successive 10% and 5% give an effective discount of only $10 + 5 - \frac{10 \times 5}{100} = 14.5\%$, not 15%.
- **C – Rs. 1,720:** Arises from applying 5% on the original Rs. 2,000 ($= 100$) and subtracting from Rs. 1,820, a computational error.
- **D – Rs. 1,750:** Corresponds to a single 12.5% discount; does not match the given successive discounts.

Final Answer: B



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

Solution to Q4

Simple Interest / Doubling and Tripling

Solution

Concept: Under Simple Interest, $SI = \frac{P \times R \times T}{100}$. When a sum *doubles*, the interest earned equals the principal ($SI = P$). When a sum *triples*, the interest earned is twice the principal ($SI = 2P$). The rate R is determined from the doubling condition and then used to find the tripling time.

Step 1 — Find the rate of interest from the doubling condition:

A sum doubles in $T_1 = 8$ years, so $SI = P$:

$$P = \frac{P \times R \times 8}{100} \implies R = \frac{100}{8} = 12.5\% \text{ per annum}$$

Step 2 — Find the time T for the sum to triple:

For tripling, $SI = 2P$:

$$2P = \frac{P \times 12.5 \times T}{100} \implies T = \frac{2 \times 100}{12.5} = \frac{200}{12.5} = 16 \text{ years}$$

Why other options are wrong:

- **A – 12 years:** $SI = \frac{P \times 12.5 \times 12}{100} = 1.5P$; total amount = $2.5P < 3P$.
- **B – 14 years:** $SI = \frac{P \times 12.5 \times 14}{100} = 1.75P$; total amount = $2.75P < 3P$.
- **D – 18 years:** $SI = \frac{P \times 12.5 \times 18}{100} = 2.25P$; total amount = $3.25P > 3P$.

Final Answer: C

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

Solution to Q5

Ratio & Proportion / Partnership Profit

Solution

Concept: In a partnership where all partners invest for equal durations, the annual profit is divided in proportion to each partner's capital investment.

Step 1 — Find the total number of ratio parts:

$$\text{Total parts} = 2 + 3 + 5 = 10$$

Step 2 — Calculate C's share of the profit:



C's investment ratio is 5 parts out of 10 total parts.

$$\text{C's profit} = \frac{5}{10} \times 80,000 = \frac{1}{2} \times 80,000 = \text{Rs. 40,000}$$

Why other options are wrong:

- **A – Rs. 16,000:** This is A's share: $\frac{2}{10} \times 80,000 = 16,000$.
- **B – Rs. 24,000:** This is B's share: $\frac{3}{10} \times 80,000 = 24,000$.
- **C – Rs. 32,000:** This incorrectly uses $\frac{4}{10}$ for C, confusing C's ratio of 5 with 4.

Final Answer: D

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

Solution to Q6

Time & Work / Combined and Individual Rates

Solution

Concept: Work rates are additive. If a worker completes a task in n days, their rate of work is $\frac{1}{n}$ task per day. The combined rate equals the sum of individual rates.

Step 1 — Set up the work-rate equation:

Let X alone take d days. Then:

$$\frac{1}{d} + \frac{1}{15} = \frac{1}{9}$$

Step 2 — Solve for d :

$$\frac{1}{d} = \frac{1}{9} - \frac{1}{15} = \frac{5}{45} - \frac{3}{45} = \frac{2}{45} \implies d = \frac{45}{2} = 22.5 \text{ days}$$

Verification: Combined rate = $\frac{1}{22.5} + \frac{1}{15} = \frac{2}{45} + \frac{3}{45} = \frac{5}{45} = \frac{1}{9} \checkmark$

Why other options are wrong:

- **B – 24 days:** $\frac{1}{9} - \frac{1}{24} = \frac{8-3}{72} = \frac{5}{72} \neq \frac{1}{15}$.
- **C – 25 days:** $\frac{1}{9} - \frac{1}{25} = \frac{25-9}{225} = \frac{16}{225} \neq \frac{1}{15}$.
- **D – 27 days:** $\frac{1}{9} - \frac{1}{27} = \frac{3-1}{27} = \frac{2}{27} \neq \frac{1}{15}$.

Final Answer: A

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



Solution to Q7

Speed & Distance / Boat Downstream

Solution

Concept: When a boat travels *downstream* (with the current), the stream aids the boat's motion. Effective downstream speed = (boat's speed in still water) + (stream speed).
Time = Distance $\div$ Speed.

Step 1 — Calculate effective downstream speed:

$$\text{Downstream speed} = 12 + 4 = 16 \text{ km/h}$$

Step 2 — Calculate the time to travel 48 km:

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{48}{16} = 3 \text{ hours}$$

Why other options are wrong:

- **A – 3.5 hours:** Would cover $16 \times 3.5 = 56$ km, not 48 km.
- **C – 4 hours:** Implies speed = $48 \div 4 = 12$ km/h, which is the boat's still-water speed. This forgets to add the stream's speed contribution.
- **D – 4.5 hours:** Would cover $16 \times 4.5 = 72$ km, not 48 km.

Final Answer: B

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

Solution to Q8

Simple Interest / Finding the Principal

Solution

Concept: Simple Interest formula: $SI = \frac{P \times R \times T}{100}$. Rearranging to find the Principal:
 $P = \frac{SI \times 100}{R \times T}$.

Step 1 — Identify the known quantities:

SI = Rs. 2,250, $R = 6\%$ per annum, $T = 5$ years.

Step 2 — Substitute into the rearranged formula:

$$P = \frac{2,250 \times 100}{6 \times 5} = \frac{2,25,000}{30} = \text{Rs. 7,500}$$

Verification: $SI = \frac{7500 \times 6 \times 5}{100} = \frac{2,25,000}{100} = \text{Rs. 2,250} \checkmark$

Why other options are wrong:



- A – Rs. 6,000: $SI = \frac{6000 \times 6 \times 5}{100} = \text{Rs. } 1,800 \neq 2,250.$
- B – Rs. 6,500: $SI = \frac{6500 \times 6 \times 5}{100} = \text{Rs. } 1,950 \neq 2,250.$
- D – Rs. 8,000: $SI = \frac{8000 \times 6 \times 5}{100} = \text{Rs. } 2,400 \neq 2,250.$

Final Answer:

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

Answer Key

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

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