TYBA COACHING CENTRE, AJMER

RMS CET CLASS VI MATHEMATICS • CHAPTER 12: SPEED, DISTANCE AND TIME — ANSWER KEY & SOLUTIONS

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Q01	Q02	Q03	Q04	Q05	Q06	Q07	Q08	Q09	Q10
(A) 20 m/s	(B) 90 km/h	(C) 60 km/h	(D) 280 km	(A) 5 hrs	(B) 72 km/h	(C) 20 sec	(D) 48 km/h	(A) 10 sec	(B) 15 km/h
Q11	**Q12**	**Q13**	**Q14**	**Q15**	**Q16**	**Q17**	**Q18**	**Q19**	**Q20**
(C) 4 km/h	(D) 45 min	(A) 50 km/h	(B) 18 km/h	(C) 200 m	(D) 6 min	(A) 900 m/min	(B) 40 km	(C) 300 m	(D) 30 km/h

SECTION I: DETAILED STEP-BY-STEP SOLUTIONS (Q01 TO Q10) — Balanced Key: 5A, 5B, 5C, 5D

Solution 01: km/h to m/s — **Correct: (A) 20 m/s**

72 × (5 / 18) = 4 × 5 = **20 m/s**.
व्याख्या: 72 × (5/18) = 20 मी/से।

Solution 02: m/s to km/h — **Correct: (B) 90 km/h**

25 × (18 / 5) = 5 × 18 = **90 km/h**.
व्याख्या: 25 × (18/5) = 90 किमी/घंटा।

Solution 03: Basic Speed — **Correct: (C) 60 km/h**

Speed = Distance / Time = 240 / 4 = **60 km/h**.
व्याख्या: चाल = 240 / 4 = 60 किमी/घंटा।

Solution 04: Distance Formula — **Correct: (D) 280 km**

Distance = Speed × Time = 80 × 3.5 = **280 km**.
व्याख्या: दूरी = 80 × 3.5 = 280 किमी।

Solution 05: Time Formula — **Correct: (A) 5 hours**

Time = Distance / Speed = 450 / 90 = **5 hours**.
व्याख्या: समय = 450 / 90 = 5 घंटे।

Solution 06: Train Crossing Pole — **Correct: (B) 72 km/h**

Speed = 180 / 9 = 20 m/s. In km/h = 20 × (18 / 5) = **72 km/h**.
व्याख्या: चाल = 180/9 = 20 मी/से = 72 किमी/घंटा।

Solution 07: Train Crossing Platform — **Correct: (C) 20 sec**

Speed = 54 × 5/18 = 15 m/s. Total Dist = 120 + 180 = 300 m. Time = 300 / 15 = **20 sec**.
व्याख्या: चाल = 15 मी/से, कुल दूरी = 300 मी। समय = 300 / 15 = 20 सेकंड।

Solution 08: Average Speed (Equal Distances) — **Correct: (D) 48 km/h**

`2xy / (x + y)` = (2 × 40 × 60) / (40 + 60) = 4,800 / 100 = **48 km/h**.
व्याख्या: औसत चाल = (2 × 40 × 60) / 100 = 48 किमी/घंटा।

Solution 09: Opposite Direction Trains — **Correct: (A) 10 sec**

Rel. Speed = 40 + 50 = 90 km/h = 25 m/s. Total Dist = 250 m. Time = 250 / 25 = **10 sec**.
व्याख्या: सापेक्ष चाल = 90 किमी/घंटा (25 मी/से), दूरी = 250 मी। समय = 10 सेकंड।

Solution 10: Downstream Boat Speed — **Correct: (B) 15 km/h**

Downstream Speed = Boat + Stream = 12 + 3 = **15 km/h**.
व्याख्या: अनुकूल चाल = 12 + 3 = 15 किमी/घंटा।

SECTION II: DETAILED SOLUTIONS (Q11 TO Q20) & NARAYAN SIR'S EXAM HACKS — Speed Optimization

Solution 11: Stream Speed from D & U — **Correct: (C) 4 km/h**

Stream = (18 - 10) / 2 = 8 / 2 = **4 km/h**.
व्याख्या: धारा की चाल = (18 - 10) / 2 = 4 किमी/घंटा।

Solution 12: Late Arrival Shortcut — **Correct: (D) 45 min**

`Usual Time = [a / |a - b|] × t` = [3 / (4 - 3)] × 15 = **45 min**.
व्याख्या: सामान्य समय = 3 × 15 = 45 मिनट।

Solution 13: Total Distance / Total Time — **Correct: (A) 50 km/h**

Total Dist = 150 + 250 = 400 km. Total Time = 3 + 5 = 8 hrs. Avg Speed = 400 / 8 = **50 km/h**.
व्याख्या: औसत चाल = 400 / 8 = 50 किमी/घंटा।

Solution 14: Minutes to Hours Conversion — **Correct: (B) 18 km/h**

5 min = 5/60 = 1/12 hr. Speed = 1.5 / (1/12) = 1.5 × 12 = **18 km/h**.
व्याख्या: 5 मिनट = 1/12 घंटा। चाल = 1.5 × 12 = 18 किमी/घंटा।

Solution 15: Finding Train Length — **Correct: (C) 200 m**

Speed = 90 × 5/18 = 25 m/s. Train Length = 25 × 8 = **200 m**.
व्याख्या: चाल = 25 मी/से। लंबाई = 25 × 8 = 200 मीटर।

Solution 16: Thief-Police Chase (Same Dir.) — **Correct: (D) 6 min**

Rel. Speed = 12 - 10 = 2 km/h = 5/9 m/s. Time = 200 ÷ (5/9) = 360 sec = **6 min**.
व्याख्या: सापेक्ष चाल = 5/9 मी/से। समय = 360 सेकंड = 6 मिनट।

Solution 17: km/h to m/min — **Correct: (A) 900 m/min**

54 km = 54,000 m; 1 hr = 60 min. Speed = 54,000 / 60 = **900 m/min**.
व्याख्या: 54,000 / 60 = 900 मीटर/मिनट।

Solution 18: Same Direction Gap — **Correct: (B) 40 km**

Rel. Speed = 55 - 45 = 10 km/h. Distance after 4 hrs = 10 × 4 = **40 km**.
व्याख्या: सापेक्ष चाल = 10 किमी/घंटा। 4 घंटे में दूरी = 40 किमी।

Solution 19: Finding Bridge Length — **Correct: (C) 300 m**

Speed = 72 × 5/18 = 20 m/s. Total Dist = 20 × 25 = 500 m. Bridge = 500 - 200 = **300 m**.
व्याख्या: कुल दूरी = 20 × 25 = 500 मी। पुल = 500 - 200 = 300 मीटर।

Solution 20: 3-Part Average Speed — **Correct: (D) 30 km/h**

Let each third = 60 km (LCM of 20,30,60). Times: 3+2+1 = 6 hrs. Avg = 180 / 6 = **30 km/h**.
व्याख्या: कुल दूरी 180 किमी मानने पर कुल समय = 6 घंटे। औसत चाल = 180 / 6 = 30 किमी/घंटा।

NARAYAN SIR'S 5 GOLDEN HACKS FOR SPEED, DISTANCE & TIME:
1. 18-Table Trick: 18 km/h = 5 m/s, 36 = 10, 54 = 15, 72 = 20, 90 = 25.
2. Equal Distance Trap: Average speed of *x* and *y* is **2xy/(x+y)**, NEVER (x+y)/2!
3. Platform/Bridge Rule: Always ADD train length + platform/bridge length.
4. Relative Speed: Opposite directions ADD (S1+S2); Same direction SUBTRACTS (S1-S2).
5. Units First: Never mix minutes with km/h or metres with km/h before converting!