Measurement of Time and Motion

Standard difficulty · 20 questions · 40 marks · Time: 36 minutes

Name: _____ Date: _____ Score: ____ / 40

Show your working for Sections B and C. Answers are on the last page — try every question first!

Section A — Choose the correct answer — 8 × 1 = 8 marks

1. The SI unit of time is the:
(a) hour **(b)** day **(c)** minute **(d)** second

2. A cyclist covers 570 m in 19 s. What is the speed?
(a) 30 m/s **(b)** 60 m/s **(c)** 49 m/s **(d)** 570 m/s

3. A speed of 95 m/s in km/h is:
(a) 475 km/h **(b)** 95 km/h **(c)** 342 km/h **(d)** 352 km/h

4. A car moves at 69 km/h for 2 hours. How far does it go?
(a) 207 km **(b)** 69 km **(c)** 71 km **(d)** 138 km

5. How long does it take to travel 220 km at 110 km/h?
(a) 2 hours **(b)** 3 hours **(c)** 110 hours **(d)** 4 hours

6. A pendulum takes 16 s for 10 oscillations. What is its time period?
(a) 1.6 s **(b)** 3.2 s **(c)** 16 s **(d)** 2.6 s

7. An hourglass measures time using:
(a) marks on a candle as it burns down **(b)** a swinging pendulum
(c) sand flowing through a narrow neck **(d)** the moving shadow of the Sun

8. Which of these is UNIFORM linear motion?
(a) a child running and then walking
(b) a train slowing into a station
(c) a car on a straight road at a steady 60 km/h
(d) a ball rolling to a stop

Section B — Short answer — 8 × 2 = 16 marks

9. What is a simple pendulum?

10. A runner covers 600 m in 50 s. Find the speed in m/s.

11. Change 126 km/h into m/s.

12. How many seconds are there in (a) 4 minutes (b) 2 hours?

13. One ghatika is 24 minutes. How many minutes are there in 30 ghatikas? How many hours and minutes is that?

14. A pendulum took 22 s, 22 s, 21 s for 10 oscillations in three tries. Find the average time for 10 oscillations, and the time period.

15. Is each motion "uniform" or "non-uniform"? (a) a car on a straight road at a steady 60 km/h (b) a bus in city traffic

16. A train's distance in each 10 minutes was 27 km, 24 km, 28 km, 20 km. Is its motion uniform? What total distance did it cover?

Section C — Word problems — 4 × 4 = 16 marks

17. Describe how to find the time period of a simple pendulum.

18. A boy cycles 800 m at 10 m/s and then walks 600 m at 5 m/s. (a) How long does each part take? (b) What is the total distance and total time? (c) What is his average speed for the whole trip?

19. A bus covers 180 km in 6 hours. (a) What is its speed in km/h? (b) In m/s? (c) How far would it go in 7 hours at the same speed?

20. Two runners run 400 m. Asha takes 50 s and Bina 52 s. (a) Find each speed in m/s. (b) Who is faster? (c) How far behind is Bina when Asha finishes?

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Answer key

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Q	Answer	Working
1	**(d) second**	—
2	**(a) 30 m/s**	570 ÷ 19 = 30
3	**(c) 342 km/h**	95 × 18/5 = 342
4	**(d) 138 km**	69 × 2 = 138
5	**(a) 2 hours**	220 ÷ 110 = 2
6	**(a) 1.6 s**	16 ÷ 10 = 1.6
7	**(c) sand flowing through a narrow neck**	—
8	**(c) a car on a straight road at a steady 60 km/h**	—
9	**A small heavy bob hung by a thread from a rigid support, free to swing.**	—
10	**12 m/s**	600 ÷ 50
11	**35 m/s**	126 × 5/18 = 35
12	**(a) 240 s (b) 7,200 s**	4 × 60; 2 × 3600
13	**720 minutes; 12 h 0 min**	30 × 24 = 720
14	**21.67 s; 2.17 s**	(22 + 22 + 21) ÷ 3; ÷ 10
15	**(a) uniform (b) non-uniform**	—
16	**No, non-uniform; 99 km**	27 + 24 + 28 + 20
17	**Tie a bob to a thread about 100 cm long and hang it from a rigid stand. Pull it slightly to one side and release. Time 10 complete oscillations with a stopwatch and divide by 10. Repeat 3–4 times and take the average.**	—
18	**(a) 80 s and 120 s (b) 1400 m in 200 s (c) 7 m/s**	800 ÷ 10; 600 ÷ 5; total distance ÷ total time
19	**(a) 30 km/h (b) 8.33 m/s (c) 210 km**	180 ÷ 6; × 5/18; × 7
20	**(a) Asha 8 m/s; Bina 7.69 m/s (b) Asha (c) About 15.4 m**	400 ÷ 50; 400 ÷ 52; 400 − Bina's speed × 50

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