

PART A: MULTIPLE CHOICE (10 MARKS)

1	2	3	4	5	6	7	8	9	10
b	a	c	a	b	d	b	d	c	c

PART B: MATCH (5 MARKS)

1	2	3	4	5
J	D	E	B	H

PART C: SHORT ANSWER (10 MARKS)

Answer the following questions in the space provided.

- (4) 1. Classify the following as (S) scalar or (V) vector quantities. (6) 2. A marathon runner in training runs 5.0 km[S] and then 18 km[N]. Assume the entire run takes 1.3 h.

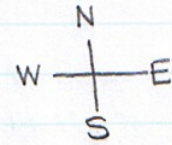
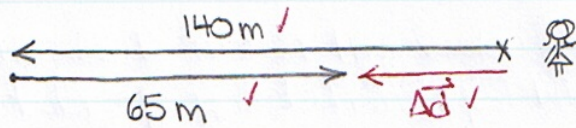
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|---------------|----------|---|--------------------|
| (a) 12 m/s[N] | <u>V</u> | (a) What is the total displacement for the run? | <u>13 km [N]</u> |
| (b) 40 min | <u>S</u> | (b) What is the average velocity? | <u>10 km/h [N]</u> |
| (c) 4.2 km | <u>S</u> | (c) What is the total distance travelled? | <u>23 km</u> |
| (d) 5.5 N[S] | <u>V</u> | (d) What is the average speed? | <u>18 km/h</u> |
- paper units in needed

PART D: PROBLEMS (25 MARKS)

Answer the following questions on a separate sheet of paper. You may use the back of this sheet if you wish.

1. Helen starts from home and walks in a straight line 140 m[W] to a friend's house. Helen and her friend then walk 65 m[E] on the same sidewalk to school.
- (3) (a) Draw a diagram showing the (i) position vectors and (ii) resultant displacement vector in this situation.
- (3) (b) Determine Helen's total distance and total displacement.
2. A dog, initially sitting next to its owner, runs first to a position 2.8 m[W] of its owner, and then secondly to a position 12.6 m[E] of its owner.
- (3) (a) Draw a diagram showing the (i) position vectors and (ii) resultant displacement vector in this situation.
- (3) (b) Determine the dog's total distance and total displacement.
3. A jogger takes 3.5 min to run once around a square city block that is 220 m on each side.
- (2) (a) Draw a sketch of the motion.
- (2) (b) Determine the jogger's average speed in m/s.
- (2) (c) Determine the jogger's average velocity upon returning to the starting position?
- (7) 4. R.R. Hood is travelling to visit her grandmother. First, she travels at an average speed of 12 km/h for 10 km. Then she travels at 8.0 km/h for another 1.25 h. Calculate her average speed for the entire trip to grandma's house? (Don't worry about the return trip - she catches a ride with B.B. Wolf)

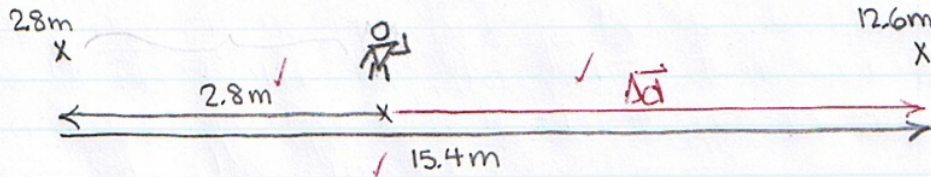
1.) a)



b) $\Delta d_T = 205 \text{ m}$ $\Delta \vec{d}_T = 75 \text{ m [W]}$

units ✓

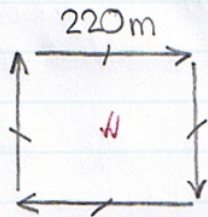
2.) a)



b) $\Delta d_T = 18.2 \text{ m}$ $\Delta \vec{d}_T = 12.6 \text{ m [E]}$

units ✓

3.) a)



b) $V_{avg} = \frac{d_{total}}{t_{total}}$
 $= \frac{220 \text{ m} \times 4}{210 \text{ s}}$
 $= 4.190 \dots$

c) $V_{avg} = \frac{\vec{d}_{total}}{t_{total}}$
 $= \frac{0}{210 \text{ s}}$

$t = 3.5 \text{ min}$
 $= 210 \text{ s}$

$V_{avg} = 4.2 \text{ m/s}$

$V_{avg} = 0$

4.) motion #1

$V_{avg1} = 12 \text{ km/h}$
 $d_1 = 10 \text{ km}$

$t_1 = \frac{d_1}{v_1} = \frac{10 \text{ km}}{12 \text{ km/h}}$
 $= 0.83 \text{ h}$

motion #2

$V_{avg2} = 8.0 \text{ km/h}$
 $t_2 = 1.25 \text{ h}$

$d_2 = v_2 t_2 = (8 \text{ km/h})(1.25 \text{ h})$
 $= 10 \text{ km}$

$V_{avg} = \frac{\Delta d_{tot}}{\Delta t_{tot}}$
 $= \frac{10 + 10}{0.83 + 1.25}$

$V_{avg} = 9.6 \frac{\text{km}}{\text{h}}$

units ✓