Science Department
Multiple Choice Answer Sheet

Test Topic: 10 Physics 1 **Name:** ANSWERS **Year:** 2023

Multiple Choice – 10 questions.

Circle your choice. If you change your mind, scrub your choice out and circle the one you want. If it is messy, clearly write your choice next to question.

1.	A	B	**C**	D
2.	A	**B**	C	D
3.	A	B	**C**	D
4.	A	B	**C**	D
5.	**A**	B	C	D
6.	A	B	C	**D**
7.	A	B	**C**	D
8.	A	B	C	**D**
9.	A	B	**C**	D
10.	**A**	B	C	D

Written Section:

Write your answers for the written section below. Ask your teacher if you need more paper.

SECTION 2: WRITTEN

Write all answers in the spaces provided. Show working. If you need more space, ask for some lined paper

Formulae you might need:

$F = m \times a$	$v = u + at$	$Ep = mxgxh$	There are 1000 m in a km.
$V_{av} = \frac{s}{t}$	$Wt = m \times g$	$Ek = \frac{1}{2} m v^2$	There are 3600 s in an hr.
$a = \frac{v-u}{t}$	$g = 9.8 \text{ m s}^{-2}$		

1. A car was involved in a time trial. The car started from rest and accelerated as quickly as possible over the straight course of 500m. It took 25 seconds to complete this distance. Determine the average speed of the car during the time trial. (2)

$V_{av} = \frac{s}{t}$ or speed = $\frac{\text{distance}}{\text{time}}$

$= \frac{500}{25}$ (1)

$= 20 \text{ ms}^{-1}$ or 20 m/s (1) −1 incorrect or no units

2. A parachutist is falling with a constant speed of 7 ms^{-1}. Calculate how long it will take to reach the ground 1200m below. (3)

$t = \frac{s}{V_{av}}$ or time = $\frac{\text{distance}}{\text{speed.}}$ (1)

$= \frac{1200}{7}$ (1)

$= 171.4$ seconds (1) −1 incorrect or no units

3. Indicate the direction and size of the resultant force for each of the following: (3)

a) 5N → , 7N →

$5+7 = 12\text{N} \rightarrow$

b) 40N →, ← 50N

$40-50$
$= 10\text{N} \leftarrow$

c) 100N →, 60N ↓

$\sqrt{60^2+100^2}$

$= 116.6\text{ N}$ ↘

4. A car, initially travelling at 15 ms^{-1}, accelerates at 2 ms^{-2} for 4 seconds.

a) Determine its final velocity. (3)

u, a, t, v

$v = u + at$ (1)

$= 15 + 2 \times 4$ (1)

$= 23\ ms^{-1}$ (1)

-1 if incorrect or no units

b) If its mass is 1600 kg, determine the force that would need to be put into accelerating it. (2)

m, F

$F = ma$

$= 1600 \times 2$ (1)

$= 3200\text{ N}$ (1)

-1 if incorrect or no units.

5. A roller coaster with mass 2000 kg falls from a height of 26 m. At the bottom of the fall, its velocity is 7 ms^{-1}. Determine the efficiency of the energy transfer from potential to kinetic.
(3)

Input E is $E_p = m \times g \times h$

$= 2000 \times 9.8 \times 26$

$= 509600\ J.$ (1)

Output E is $E_k = \frac{1}{2} m v^2$

$= \frac{2000}{2} \times 7^2$

$= 49000\ J.$ (1)

$\eta = \frac{49000}{509600} \times 100$

$= 9.62\%$ (1)

End of Test /26