**MINEDUC**



 **EASTERN PROVINCE**

 **GATSIBO DISTRICT**

 **ORDINARY LEVEL CANDIDATES’ PHYSICS EXAMINATIONS**

 **SECOND TERM, 2023**

 **SUBJECT: PHYSICS I**

 **LEVEL: S1**

 **DATE… /03/2023**

 **DURATION: 3 HOURS**

 **INSTRUCTIONS:**

This will be one paper of **21** Questions that a candidate will sit for, in three hours.

This comprehensive assessment paper will be made of **Two** parts **A** and **B** Carrying **100** Marks in total.

**PART I MULTIPLE CHOICE QUESTIONS**: A candidate will answer all **15** questions in total of **30** Marks

**PART II ATTEMPT ALL QUESTIONS**

: This Section will be comprised of **6** questions; A candidate will attempt all questions carrying **70** marks.

**PART I MULTIPLE CHOICE QUESTIONS (2marks for each )**

1) Which set of quantities are all vectors

 a) Acceleration, displacement, velocity

b) Chemical energy, mass, power

c) Extension, force, gravitational potential energy

c) Weight, kinetic energy, work

2)Newton’s third law involves two quantities which are equal in size and opposite in direction .What is the unit for these two quantities?

a) J

b) m/s2

c) N

d) W

3. During an experiment to find the density of a stone, the stone is lowered into a measuring cylinder partly filled with water.

Which statement is correct?

a) The difference between the readings gives the density of the stone.

b) The difference between the readings gives the volume of the stone.

c) The final reading gives the density of the stone.

d) The final reading gives the volume of the stone.

4. What is the size of the resultant of the two forces shown in the diagram?

4.

3.0

 N

4.0

 N

 A 1.0N B 3.5N C 5.0N D 7.0N

1. A length of cotton is measured between two points on a ruler.



When the length of cotton is wound closely around a pen, it goes round six times.

 pen Six turns of cotton

 

What is the distance once round the pen?

* 1. 2.2 cm B 2.6 cm C 13.2 cm D 15.6 cm

6. A car is moving along a straight, level road, with a constant acceleration. Which graph shows the motion of the car?

 A

 Distance B

Distance

 0 time 0 time

 Time Time

 speed C D

speed

1. time time

7. A car takes 15 minutes to travel along a road that is 20 km long.

What is the average speed of the car?

A 0.75 km / h B 5.0 km / h C 80 km / h D 300 km / h

1. An empty beaker is placed on a top-pan balance. Some water is now poured into the beaker.

0.106

kg

0.062

kg

 empty beaker beaker + water

What is the weight of the water?

* 1. 0.044 kg B 0.168 kg C 0.0044 N D 0.44 N

9)Three liquids P, Q and R have different densities and do not mix. The liquids are placed in a measuring cylinder and allowed to settle. A small block is then dropped into the measuring cylinder and comes to rest, as shown.

block

R

Q

P

Which statement about the density of the block is correct?

1. It is equal to the density of Q.
2. It is greater than the density of P.
3. It is greater than the density of R.

D.It is less than the density of Q.

10.The diagram shows some liquid in a measuring cylinder.

The mass of the liquid is 16 g.

25

20

15

10

5

cm

3

What is the density of the liquid?

A)0.80 g / cm 3 B )1.25 g / cm 3 C )36 g / cm 3

D )320 g / cm 3

11.A car is moving in a straight line on a level road. Its engine provides a forward force on the car.A

second force of equal size acts on the car due to resistive forces.

Which statement describes what happens?

* 1. The car changes direction.
	2. The car moves at a constant speed.
	3. The car slows down.
	4. The car speeds up.

12.A hole is drilled in a square tile. The diagram shows the tile hanging freely on a nail.

Where is the centre of mass of the tile?

**A**

**D**

**B**

**C**

nail

tile

13.The diagram shows the energy transferred in a lamp in one second.

total energy in

= 100

 J

=

60

 J light energy out

wasted energy out = 40j

Which type of wasted energy is produced by the lamp?

* 1. chemical potential energy
	2. electrical energy
	3. gravitational potential energy

d. thermal energy

14.Which energy resource is not renewable?

* 1. fossil fuel
	2. sunlight
	3. tides
	4. wind

15.A student does work by pulling a box across a horizontal floor.

She now pulls a second box along the same floor.

Which row indicates that the student is now doing twice as much work?

|  |  |  |
| --- | --- | --- |
|  | force used to pull box  | distance the box is pulled  |
| A  | is doubled  | is doubled  |
| B  | is doubled  | is halved  |
| C  | stays the same  | is doubled  |
| D  | stays the same  | is halved  |

**PART II ATTEMPT ALL QUESTIONS**

16. A car accelerates from rest to a velocity of 20 m/s in 5 s. Thereafter, it decelerates to a rest 8 s. the acceleration in of the car

(a) in the first 5 s

(b) in the next 8 s **/5marks**

17. a)Give five types of simple machine **/5marks**

b)A block tackle pulley system has a velocity ratio of 4. If its efficiency is 75%. Find the

(i) Mechanical advantage. **3marks**

(ii) Load that can be lifted with an effort of 500 N.**3marks**

(iii) Work done if the load is lifted through a vertical distance of 4.0m. **3mrks**

(iv)Average rate of working if the work is done in 2 minutes.**3marks**

18. (a) List four forms of energy **4marks**

(b) State the law of conservation of energy. **2 marks**

(c) Differentiate between kinetic energy and potential energy. **2marks**

d)Afork-lift truck raises a 400 kg box through a height of 2.3m. The case is then moved horizontally by the truck at 3.0 m/s onto the loading platform of a lorry.

i)How much Potential energy(P.E) is gained by the box. **2marks**

ii)Calculate The Kinetic Energy(K.E) Of the box while being moved horizontally. **2marks**

19.a) Differentiate the centre of gravity from centre of mass. **4marks**

b) why a taller person is likely to fall down more than a short person while they are climbing a mountain.**2marks**

c) Describe how you can determine the centre of gravity of irregular lamina shown below.**6marks**



20.Define a) energy **2marks**

 b) work**2marks**

c)power**2marks**

 d) A man lifts weight of 300N through a vertical height of 5m in 10 seconds. Determine the man's power. **3marks**

21. In an experiment to determine the density of steel , a number of pieces of iron with different masses were used . The volume and the mass for each piece of a steel were measured . The table below shows the results obtained.

|  |  |
| --- | --- |
|  **Volume /cm3** | **Mass /g** |
| 2 | 16 |
| 3 | 25 |
| 4 | 32 |
| 5 | 28 |
| 6 | 48 |
| 7 | 56 |

1. Plot a graph of mass ( along y- axis ) against volume ( along x-axis) **10marks**
2. Determine the gradient (slope) of the graph and show how you determine the gradient ( slope) **3marks**
3. Determine the density of the steel **2marks**

 …………………………….End……………………………………………