**SUNSHINE SECONDARY SCHOOL**

**NAME: ------------------------------------------------CLASS---- --------INDEX NO. -----------------------------**

 **DATE: -------------------------**

**232/1**

**FORM 4**

**PHYSICS**

**PAPER 1**

**PRE MOCK EXAM - MARCH 2013**

**TIME: 2 HOURS**

**INSTRUCTIONS**

**i)** Answer **all** questions in the spaces provided

**ii)** Non programmable scientific calculators and mathematical tables may be used

**iii)** All numerical answers must be expressed in **decimal notation**

**iv**) This paper has 10 **printed** pages .it is the responsibility of the candidates to ensure that there are no missing pages.

**Constant: g=10n/kg**

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| --- | --- | --- | --- |
| Section | Questions | Maximum score | Candidate’s score |
| Section A | 1-15 | 25 |  |
| Section B | 16-20 | 55 |  |
| Total | 20 | 80 |  |

**SECTION A (25 MARKS)**

**ANSWER ALL THE QUESTIONS IN THIS SECTION**

1) State the reading on the micrometer screw gauge shown below.

 

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2) An oil drop forms a circular patch of area 5x10-3 m2.If the oil drop has a volume 9x10-12 m3, calculate the thickness of the oil molecule

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3) Name one non contact force-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------(1mark)

4) A crane just lifts 9940N when an effort of 116N is applied and its efficiency is 75%. Find it’s velocity ratio.

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5) The mass of a vessel is 90g and its specific heat capacity is 420J/Kgk. Calculate its heat capacity

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6) Explain the term absolute zero temperature--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------(1mark)

7) Two table tennis balls are suspended from a support by thin string and air is blown between them. Explain the consequent motion of the balls.

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8) State the Hooke’s law. ---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------(1mark)

9) Give **a reason** why heat transfer by radiation is faster than heat transfer by conduction.

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10) The moment of the weight of vertical door does not significantly affect the moment of the force to the door .Give a reason for this---------------------------------------------------------------------

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11) In the Brownian motion experiment, smoke particles are observed to move randomly. Explain how this motion is caused.-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------(2marks)

12) Give **reason** why weight of a body varies from place to place---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------(1mark)

13) The figure below shows a fire alarm circuit. Explain how the alarm functions.

 

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14) State the **reason** why water spilled on a glass surface wets the surface.

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15) Two liquids of density 1100kg/m3 and 850kg/m3 are mixed in equal volumes .The mixture fills a tank of 300cmx40cmx50cm to the brim. Calculate the mass of each liquid.

-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------(3marks)

 **SECTION B (55 MARKS)**

**ANSWER ALL THE QUESTIONS IN THIS SECTION**

16) The figure below shows a hydraulic press system using a lever of negligible mass, on the side of the small piston, pivoted at point P. A force of 50N is applied.

 

a) Calculate the:

i) Force exerted by the small piston on the liquid

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ii) Pressure of the liquid below the small piston.

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iii) Weight of the object supported on the larger piston

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b) State two properties of the fluid used in the hydraulic press.

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17) a) State Newton’s second law of motion

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b) A body accelerates uniformly from rest to 30m/s in 10s.Find its acceleration

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c) A car of mass 800kg moving with a speed of 15m/s crashes into a wall and comes to rest in 0.4 s. Find the :

i) Impulse-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------(3 marks)

ii) Average force by the wall

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d) A steel ball is released at the top of a tall glass cylinder containing a viscous liquid. Sketch the velocity –time graph for this motion (2 marks)

18) a) State the law of flotation

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b) A uniform glass test tube of diameter 1.62cm containing lead shots floats in water with 14.9 cm in water.

i) State the function of the lead shots

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ii) Calculate the total mass of tube and its contents

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iii) Find the length immersed in a liquid of relative density of 1.6

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C) A solid displaces 5cm3 of paraffin when floating and 25cm3 when fully immersed. Determine the density of the solid (Density of paraffin =800kg/m3)

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19) a) A ball of mass 200g tied to a spring is being whirled in a vertical circle of radius 0.4m with uniform speed. At the lowest position, the tension in the string is 2.8N.Calculate the:

i) Uniform speed of the ball

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ii) Tension in the string when the ball is at the upper most position of the circular path

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b) A metal ball of mass 10kg is rotated horizontally by means of a rope 4m long .If its linear speed is 30m/s, find the force that will break the rope.

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c) A body moving with uniform speed in a circular path is accelerates. Explain

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 20) a) State the principle of moments

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b) A uniform wooden lath measuring 200cm by 25cm by 15cm is suspended at the 150cm mark and balanced horizontally by hanging a mass of 14 kg at the 200cm mark. Calculate the:

i) Mass of the wooden lath

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ii) Density of the material of the wooden lath

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iii) Tension in the rope supporting the system

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