FORM 2

PHYSICS

MID TERM EXAMINATION - JUNE 2016

2 HOURS

**NAME:……………………………………………………………CLASS:…………ADM NO: ……………**

**INSTRUCTIONS**

* Answer all questions in the space provided
* This page consists of two sections A and B
* All working must be shown clearly
* Electronic calculators may be used.

**EXAMINER’S USE ONLY**

|  |  |  |  |
| --- | --- | --- | --- |
| **SECTION** | **QUESTION** | **MARKS** | **CANDIDATE’S SCORE** |
| A | 1-11 | 25 |  |
| B | 12 | 14 |  |
|  | 13 | 14 |  |
|  | 14 | 12 |  |
|  | 15 | 10 |  |
|  | 16 | 5 |  |
|  |  | 80 |  |

**SECTION A ( 25 MARKS)**

1. State three properties of magnetic field lines. (3mks)
2. The figure below shows vernier calipers scale.

State the correct reading of scale if the instrument has a zero error of – 0.02cm. (2mks)

3.State the reason why images formed by plane mirrors cannot be focused on a screen. (1mk)

4.Name the instrument that would be most suitable for taking the following measurements.

i) The diameter of a ball bearing.

ii)The thickness of one sheet of this question paper. (2mks)

5. You are provided with a charged electroscope, an insulator and a conductor. Describe how you would use these apparatus to distinguish the insulator from the conductor. ( 2mks)

6. A Perspex container with a square base of side 5cm has water to a height of 7cm. When a pebble is immersed into the water, the level rises to 10cm. What is the volume of the pebble?

 (2mks)

7. State and explain what happens to the motion of smoke particles in the smoke cell experiment when the apparatus is moved from a warm to a cooler environment? (2mks)

8. In an oil drop experiment, a student estimated the diameter of an oil molecule as 1.6 x 10-9 m. Given that the volume of the oil drop was 0.22mm3, determine the area of the patch. ( 3mks)

9. A girl observes her face in a concave mirror of focal length 90cm. If the mirror is 70cm away state three characteristics of the image observed. (3mks)

10. Calculate the amount of current if 144c of charge flows through a point in 30 minutes.

 (2mks)

11 State three properties that make a liquid suitable to be used as a brake fluid. (3mks)

**SECTION B ( 55 MARKS)**

12. a) State Pascal’s principle. (1mk)

b)A manometer containing water shows a difference in level of 10cm when connected to a laboratory gas supply. Calculate the pressure exerted by the gas supply. (Atmospheric pressure = 1.0 x 10sN.m2)

c) State two factor affecting pressure in solids. (2mks)

d) An outlet of diameter 1m is made 20m below the surface of water in a dam. What would be the force with which the water spew out when it is fully opened? ( g = 10N/kg and density of water is 1g/cm3) (3mks)

e)The figure below shows a hydraulic brake system.

A force of 20N is applied on the foot pedal connected to a piston of area 0.005m2 and this causes a s topping force of 5000N. Calculate;

i)Pressure in the master cylinder (2mks)

ii)Area of the slave piston (2mks)

f) Give one advantage of the hydraulic brake system. (1mk)

13. a) Define moment and give its SI units. (2mks)

b) State the principle of moments. (1mk)

c)A uniform metre rule of mass 120g is pivoted at the 60cm marks. At what point on the metre rule should a mass of 50g be suspended for it to balance horizontally? (3mks)

d) A uniform metre rule of mass 150g is pivoted freely at the 0cm mark. What force applied vertically upwards at the 60cm mark is needed to maintain the rule horizontally? (3mks)

e) Define the centre of gravity. (1mk)

f) Differentiate between stable and neutral equilibrium. (2mks)

g) Give two practical applications of stability. (2mks)

14. a) Give one disadvantage of a convex mirror used as a driving mirror. (1mk)

b) Define the following terms:

1. Virtual image
2. Diminished image
3. Inverted image

c) An object of height 9cm is placed 18cm in front of a convex mirror of focal length 9cm. By scale drawing, determine the :-

i) the position of the image. (2mks)

ii) size of the image. (2mks)

iii)The magnification of the image. (2mks)

d) Give one defect of spherical mirrors and state the mirror which overcomes it. (2mks)

15. a) State two properties of magnets. (2mks)

b) Using the domain theory of magnetism, explain why the strength of a magnet cannot be increased beyond a certain value. (2mks)

c) State the clock rule. (2mks)

d) Define the following:- (1mk)

i)Magnetic field

ii) Magnetic lines of force

e)Using a suitable diagram, describe how bar magnets are stored. (3mks)

16. a) Write the following in standard form. (2mks)

i) 0.00002692

ii) 1500

b) Given that the diameter of an oil f drop is 0.15cm and the diameter of a circular patch formed by the same drop on water is 35.35cm. Calculate the thickness of the oil molecule . (2mks)

c) Give one assumption made in the oil drop experiment. (1mk)