GATITU MIXED SECONDARY SCHOOL

MID - TERM EXAM

TERM 3-2014

FORM 3 PHYSICS

1 a) State the principle o f the moments (1mk)

b) A uniform beam of weight W is supported as shown below so that it balances horizontally

Beam

20kg

0.8m 5m

Find the weight of the beam (take G as 10N/KG) (4mks)

2. a) Define the current and state its SI units (2mks)

b) A charge of 180 coulombs flow through a lamp every minute. Calculate the current flowing through the lamp (2mks)

c) Explain why lights in a house are wired in parallel instead of series (2mks)

3. a) Name the forces acting on the cork

Cork

Thread

b) Describe how each of the forces mentioned above changes when water is added into the beaker until it fills up (3mks)

4) State three advantages of friction (3mks)

5) A charge of 2550 coulombs past at a point in circuit in 50 min, what is the currents in Amperes (2mks)

6) An echo sounder sends a sound signal to the bottom of a lake and receives it back after 0.06 seconds. Determine the height of a lake (3mks)

**SECTION B (55mks**)

7. a) Distinguish between liquids and solids states of mater in terms of intermolecular forces (2mks)

b) In an experiment to estimate the diameter of an oil molecule on an oil drop of diameter 0.05 cm spread over a circular patch of diameter 20cm.

Deter mine

i) The volume of the patch covered by the oil (2mks)

ii) The area of the patch covered by the oil (2mks)

ii) The thickness of the patch covered by the oil (3mks)

iv) State any two assumption made in the experiment (2mks)

7. a) Define the following terms as applied in the convex and concave mirrors

i) Principal focus (2mks)

ii) Centre of curvature (1mk)

iii) Focal plane (1mk)

8. a) state the hookes law (2mks)

b) A mass of 100g is suspended from the lower end of a spring. If the spring extends by 100mm and the elastic limit of the spring is not exceeded. What is the spring constant ( 3mks)

c) Two identical springs each of spring constant k=200N/M are arranged in parallel. If a mass of 500g is suspended on them, find the extensions on the system (3mks)

d) A light helical springs hangs vertically with its upper end fixed. A pointer is attached to its lower end. The following table shows results after various masses were hung on its end

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Mass attached (kg) | 0 | 0.2 | 0.4 | 0.6 | 0.8 | 1.0 |
| Scale reading (mm) | 120 | 126 | 132 | 136 | 144 | 152 |
| Weight attached (N) |  |  |  |  |  |  |
| Extension (m) |  |  |  |  |  |  |

i) Complete the table above (3mks)

ii) Plot a graph of extension (y-axis) against weight (5mks)

iii) Use the graph to calculate spring constant (3mks)

iv) From the graph, find the mass that can cause an extension of 15mm (2mks)

9. Define magnification (1mk)

b) An object is placed (a) 18cm (b) 6cm in front of a concave mirror of a focal length 12cm. Determine the position and nature of the image in each case (6mks)

c) State the advantage and disadvantage if using a convex mirror as a driving mirror (2mks)

10. a) Express each of the following in m/s

i) 216km/h

ii)1.8× 105 km/ hr

b) Express each of the following to km/hr

i) 60m/s

ii) 3× 18 m/s (2mks

11. Define refraction (1mk)

12. A body uniformly accelerated from the rest to a final velocity of 200m/s in 20seconds

Calculate the distance covered (3mks)

b) A body whose initial velocity is 60m/s moves with a constant retardation of 6m/s2. Calculate the time take for the body to rest (3mks)

c ) Sketch a distance time graph for a stationary body (1mk)