

GATITU SECONDARY SCHOOL, P.O. BOX 327 – 01030, GATUNDU.

FORM 3 PHYSICS. END OF TERM 3 EXAMINATION. 2014

Name: _____ Adm: _____ Class: _____

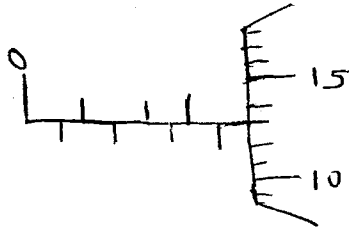
TIME 2 HOURS.

INSTRUCTIONS TO CANDIDATES:

- Write your Name, Class and Adm. No in the spaces provided above.
- Answer all the questions in section A and section B in the spaces provided.
- Mathematical tables and electronic calculators may be used.

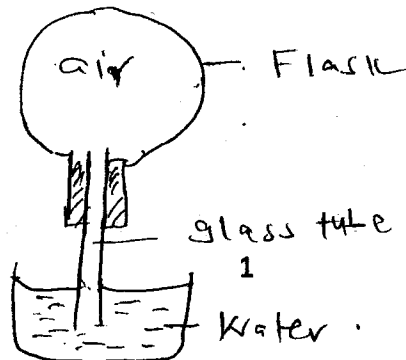
SECTION 'A'

1. The figure below shows a micrometer screw gauge used to measure the diameter of a metal rod.



When the rod is removed and the jaws of the micrometer screw gauge are closed, the reading is 0.12 mm. Determine the diameter of the rod. (3mks)

2. The figure below shows a flask full of air tightly fitted with a glass tube dipped into a beaker containing water at room temperature.



Ice-cold water is poured on the flask.

i) state what happens

(2mks

ii) Give a reason for your answer in (i) above.

(2mks

3. State the two factors that affect surface tension of water.

(2mks

4. 200cm³ of oxygen is collected at 27°C and 75cmHg. Calculate its volume at 0°C and 76cmHg.

(3mks

5. Explain why hydrogen sulphide from a rotten egg broken at one end of the room soon spreads throughout the room.

(2mks

6. A bottle has a mass of 1.85×10^{-2} kg when empty and 4.25×10^{-2} kg when full of a liquid. If the bottle has a capacity of $2.0 \times 10^{-5} \text{m}^3$, determine the density of the liquid in g/cm^3 .
(4mks)

7. In a game of volleyball Beatrice is seen to receive the ball while bending and with her legs wide apart. Explain.
(3mks)

8.(i) State Hooke's law.

(2mks)

ii) An object of weight 20N attached at the end of a spring causes an extension of 0.5cm on the spring.
(3mks)

- b) Determine the weight of an object that would cause an extension of 0.86cm when attached at the end of the spring above. (3mks)

9. What is laminar flow? (1mk)

SECTION 'B'

10(a) What is a machine? (2mks)

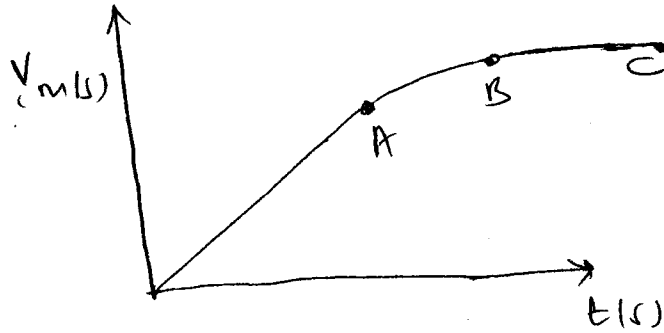
- b) Two gear wheels have 80 teeth (driven) and 20 teeth (driving) and lock with each other. They are fastened on axles of equal diameters such that a weight of 150N attached to a string wound on one axle will just raise 450N on the other axle. Calculate.

i) Mechanical advantage (2mks)

ii) Velocity ratio (2mks)

iii) Efficiency of the machine. (2mks)

11.a) The figure below shows a velocity time graph for the motion of a certain body.



Describe the motion of the body in the region.

i) OA (2mks)

ii) AB (2mks)

iii) BC (2mks)

b) A car moving initially at $10m/s$ decelerates at $2.5m/s^2$. Find
i) its velocity after 1.5 seconds (2mks)

ii) The distance travelled in 1.5 seconds (2mks)

iii) The time taken for the car to stop. (2mks)

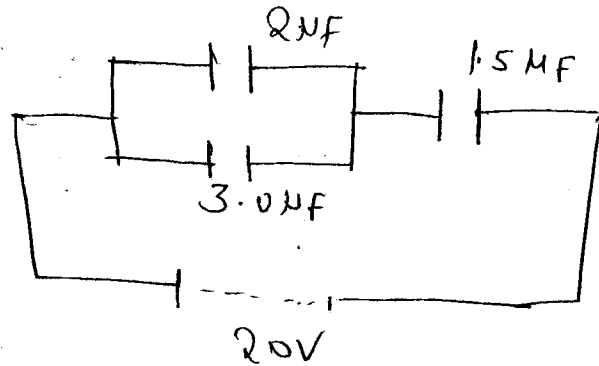
iv) Sketch a velocity – time graph for the motion of the car up to the time the car stopped. (3mks)

v) From the graph, determine the distance the car travelled before stopping. (3mks)

12a) State Newton's second law of motion. (2mks)

b) An arrow of mass 100g travelling horizontally at 15m/s hits a block of wood of mass 400g lying at rest on a smooth surface. Calculate the common velocity after the impact. (3mks)

13. The figure below shows a capacitor network.



a) Find the combined capacitance in the network.

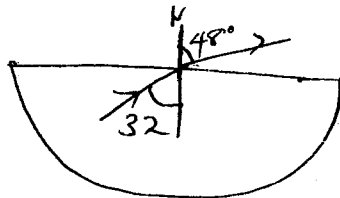
(3mks)

b) The charge through 1.5mf capacitor in the arrangement.

(3mks)

14. An electric heater is rated 3kw. What is the electrical energy in kwh consumed by the heater when used on a 240V supply for 180 minutes. (4mks)

15. The figure below shows a ray of light falling normally on the curved surface of semicircular glass block A, at an angle of at O, and emerges into the air at an angle of 48° .



Calculate the refractive index of the glass of which the block is made.

(3mks)

16. A mine worker stands between two vertical cliffs 500m from the nearest cliff. The cliffs are X metres apart. Every time he strikes the rocks, he hears the echoes, the first one coming after 2.5 seconds while the other comes after 3 seconds. Calculate the distance between the cliffs. (4mks)

17. A car starts from rest and accelerates with a uniform acceleration of 10m/s^2 for 4 seconds. Determine the final velocity of the car. (2mks.)

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