



Physics 232/2

Form 3

**MARCH EXAMINATION 2021**

**2 hours**

Additional Materials:

- Soft clean eraser
- Soft pencil (type B or HB recommended)

*Read these instructions first*

This paper contains 2 sections. Answer all questions in the spaces provided.

Do **not** use staples, paper clips, and glue or correction fluid.

Any rough working should be done in the rough work booklet provided.

NAME: .....

DATE: .....

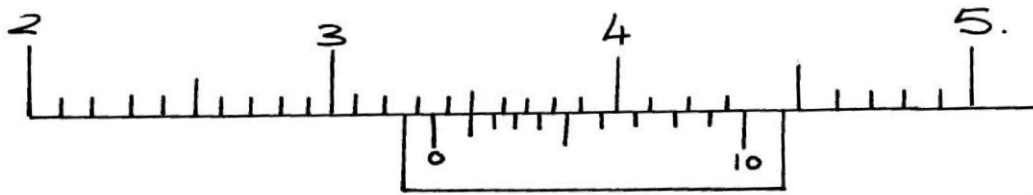
SCORE:

TOTAL MARKS:

[Turn over]

**SECTION A 25MARKS**

1. The Vernier calipers shown below have a zero error of -0.06 cm



State the actual reading of the instrument (2mks)

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.....

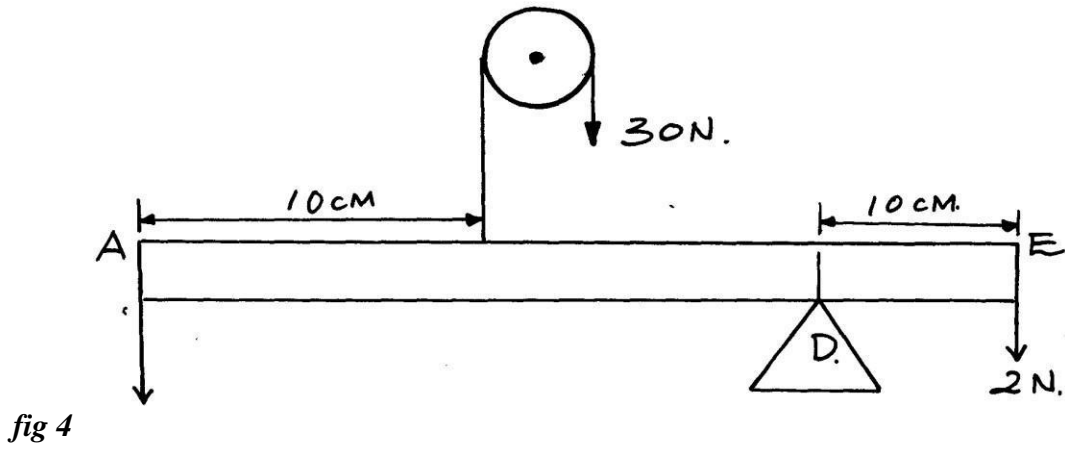
2. Draw a sketch of a micrometer screw gauge showing a reading of 8.53mm. (3mks)

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.....

3. Sketch a Vernier calipers scale reading 3.41 cm. (3mks)

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.....

4 **Figure 4** shows a uniform rod **AE** which is 40cm long. It has a mass of 2kg and pivoted at **D**.  
If 2N is acting at point **E**, and 30N force is passed through a frictionless pulley



X  
Find the force (x) acting at end A (3mks)

5. State **two** ways in which stability of a body can be increased (2mks)

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 .....

6. Use the domain theory to explain the process of magnetization (3mk)

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 .....

7. One end of a metal rod is heated in a flame. After some time the other end becomes hot.  
Explain this observation (2mks)

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.....

8. State Newton's first law of motion (2mk)

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9. State the law of **linear momentum** (2mk)

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10. Give a reason why bodies in circular motion undergo acceleration even when their speed is constant (**1mk**)

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.....

11. Define angular velocity. (1 mk)

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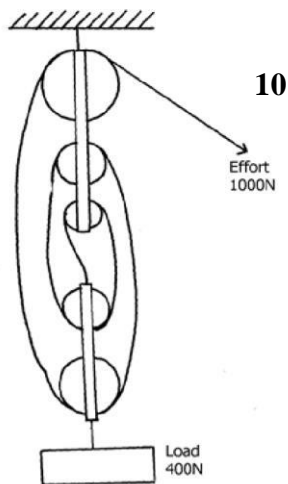
12. Define work and state its SI unit (1 mk)

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.....



14. Vicky performed an experiment using a pulley system as shown in the figure.

**Figure 13**



(a) What is the V.R. of the system? (2mks)

(b) Determine the M.A. of the system.(3mks)

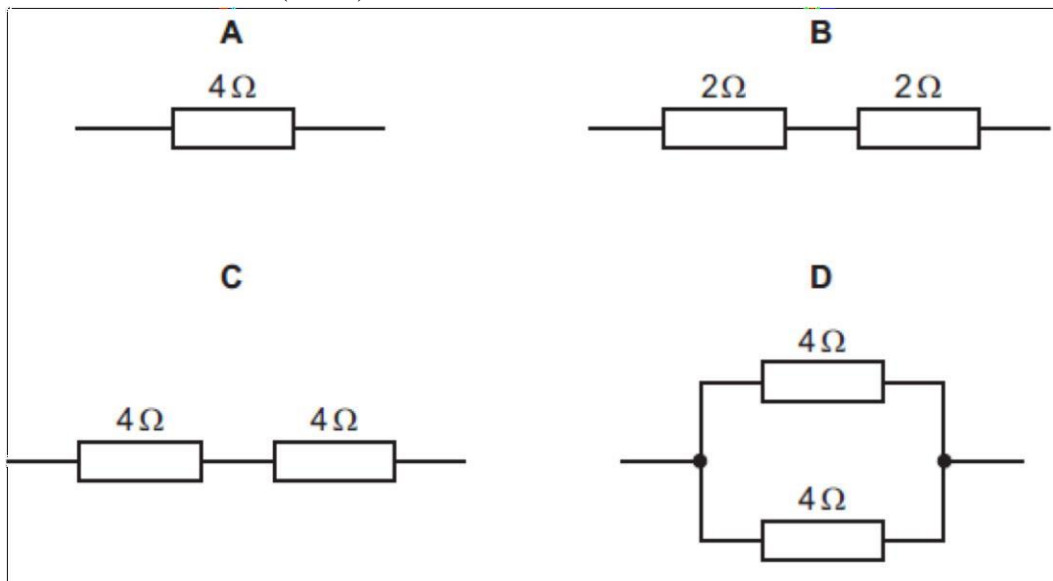
(c) Calculate the efficiency of the system.(3mks)

(d) Explain why efficiency of a practical machine is always less than 100%(2mks)

- (e) If the load moves a distance of 5 cm. find the work done on the load. (3mks)
15. (a) A crane lifts a load 500kg through a vertical distance of 4m in 8 seconds. Determine: (i)  
Work done by the crane (3mks)
- (ii) Power developed by the crane (2mks)
- (iii) Efficiency of the crane given that it is operated by an electric motor rated 2.8Kw  
(3mks)
- (iv) State **two** effects which contribute to the efficiency being less than 100 %( 2mks)
- (b ) A wheel and axle are used to raise a load of 280N by a force 40N applied to the rim of the  
Wheel. If the radii of the rim and axle are 70cm and 5cm respectively, calculate: (i) The  
mechanical advantage (2mks)
- (ii) The velocity ratio (2mks)

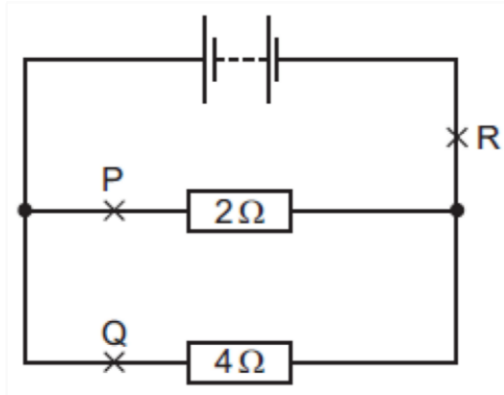
(iii) The efficiency (2mks)

16. a) The diagrams show four arrangements of resistors. Which arrangement has the smallest total resistance? (4mks)



b) A circuit contains two resistors connected in parallel with a battery.





Which of the following statements about the currents at P, Q and R is true?

The current at P is the greatest. (1mk)

The current at Q is the greatest. (1mk)

The current at R is the greatest. (1mk)

c) The current is the same at points P, Q and R(1mk)

d) Three resistors are connected in series across a 75-V potential difference.  $R_1$  is  $170\Omega$  and  $R_2$  is  $190\Omega$ . The potential difference across  $R_3$  is 21 V.

Find the current in the circuit. [2mks]

Find the resistance of  $R_3$ . [2mks]

17. (a) State **two** liquids which are used in thermometer. (2mks)

(b) With a reason, state which of the two liquids in 3 (a) above is used to measure temperature in areas where temperatures are:

(i) Below  $-40^{\circ}\text{C}$  (1mk)

(ii)  $150^{\circ}\text{C}$  (1mk)