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232/2
PHYSICS
PAPER 2
(Theory)
July/August – 2009
Time: 2 Hours

INTERZONAL

Kenya Certificate of secondary Education

Physics
Paper 2
July/August – 2009
Time 2 Hours

1 (a) Define the term velocity ration as applied in machines (1 mk)

(b) A machine with a velocity of 5 requires 8000 of work to raise a load of 600N through a vertical distance of 1m. Determine:

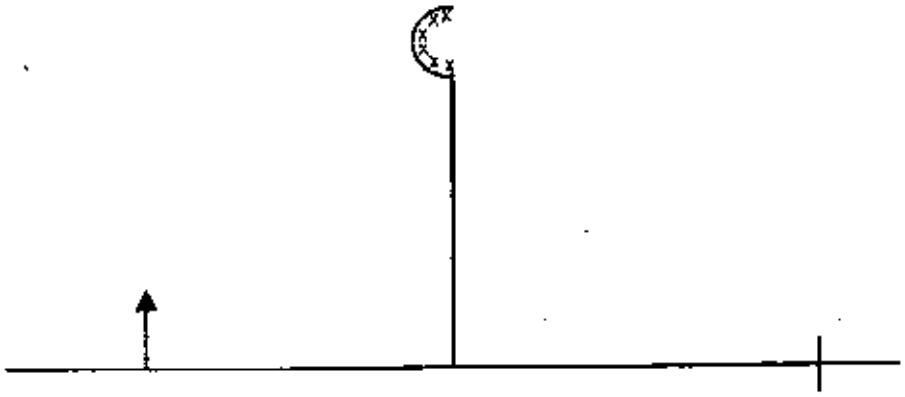
(i) The mechanical advantage of the machine (3 mks)

(ii) The efficiency of the machine (3 mks)

(c) State two factors that influence the magnitude of centripetal force of a body around a circle (2 mks)

(d) An object of mass 4kg moves around a circle of radius 6m. If the required centripetal force is 96N. Calculate the speed of the mass (3 mks)

2.



On the same diagram draw the appropriate rays and locate the image formed (2 mks)

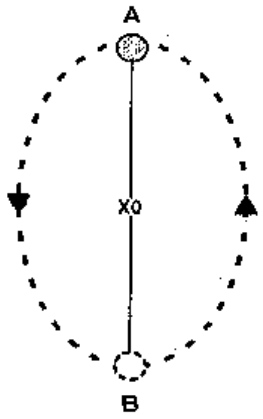
3. In a certain pinhole camera, the screen is 10cm from the pinhole. When the camera is placed 6m away from a tree, a sharp image of the tree 16cm high is formed on the screen. Determine the height of the tree. (2 mks)

4. The refractive index of paraffin is 1.47 and that of glass is 1.55. Determine the critical angle of a ray of light traveling from glass to paraffin (3 mks)

5. In the thermometer, the level of mercury first falls and then rises gradually until a steady level is reached. Explain the three underlined observations (2 mks)

6. How does the rate of diffusion depend on the size and mass of a gas (2mks)

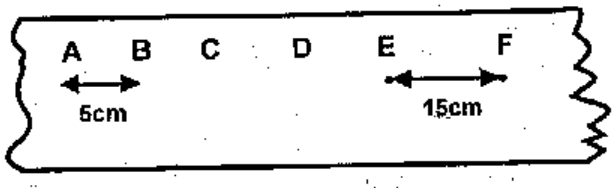
7. A bob of mass 0.5 kg is in uniform circular motion in vertical plane of radius 100m as shown in figure (6) below



It is whirled at a frequency of 2 cycles per second. Calculate the tension in the string when the body is at point A and B. (3 mks)

SECTION B

Fig below shows a large tape made from a ticker tape timer running at 50Hz.



(a) What type of electric current is used to operate the ticker timer? (1mk)

(b) AB=5cm and EF + 15cm. find

(i) The time interval for one tick (1 mk)

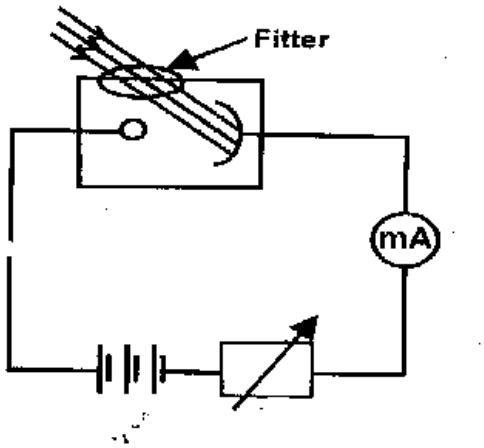
(ii) The velocity at point AB and EF (2 mks)

(c) A ball was thrown from the top of a cliff 11.25 m high with a horizontal velocity of 15m/s. Calculate:

(i) The time taken by the ball to strike the ground (2 mks)

(ii) The distance from the foot to the cliff to where the ball strikes the ground (2 mks)

9. The figure below shows a circuit diagram with a photocell.



(i) State one use of the filter in the set up (1mk)

(ii) Explain how the milliameter shows a deflection when utra violet radiation is shone on the photocell (2 mks)

(iii) Explain how the milliameter reading is affected when a glass is introduced between the source of UV and the photocell (2 mks)

(b) In an experiment to investigate photoelectric emission from a clean metal surface the following results were obtained.

Stopping V_s(V)	0.75	1.75	2.50	3.50	5.00	6.74
Frequantly (f) x 10^{15}Hz	1.20	1.50	1.70	2.00	2.40	2.90

(i) Pot a graph of stopping potential, V_s (y- axis) against frequency (5 mks)

(ii) From the graph , determine the threshold frequency on the metal surface. (1mk)

(iii) Use the graph to determine the planck's constant
(charge of an electron = 1.602 x 10^{-19}C.) (2mks)

10 (a) Distinguish between a longitudinal and transverse wave (1mk)

(b) Fig 4 below shows a displacement – time graph of a wave. The velocity of the wave is 40cm/s

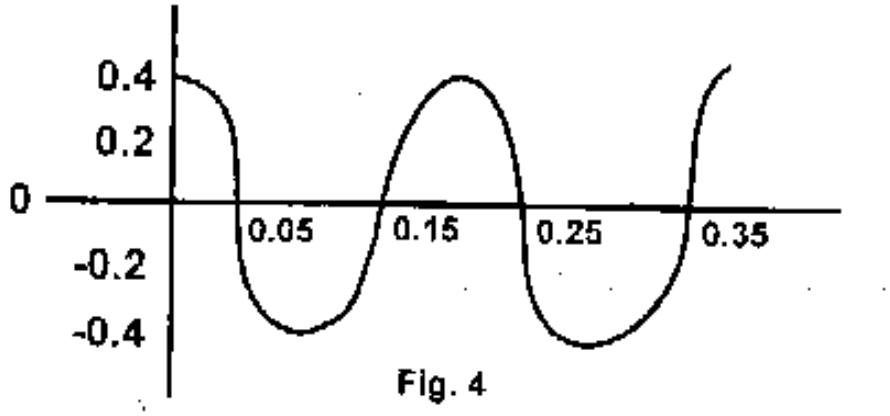


Fig. 4

Determine:

(i) The amplitude (1 mk)

(ii) The period (1 mk)

(iii) The wave length (2 mks)

(iv) The frequency (2 mks)

11 (a_ (i) Sttae Bernoullis principal (1 mk)

(ii) Define streamline flow (1 mk)

(b) A sprinkler has 50 holes each of x- sectional area $2 \times 10^{-6} m^2$. If it is supplied by water through a horse pipe of x- sectional area $24 cm^2$ at a speed of speed 0.6 ms

Calculate:

(i) The flow rate in the horse pipe in m^3/s (3 mks)

(ii) The speed at which water emerges from the holes (3 mks)

(c) State the application of Bernoulli's effect (3 mks)

12 (a) State Faraday's law of electromagnetic induction (1 mk)

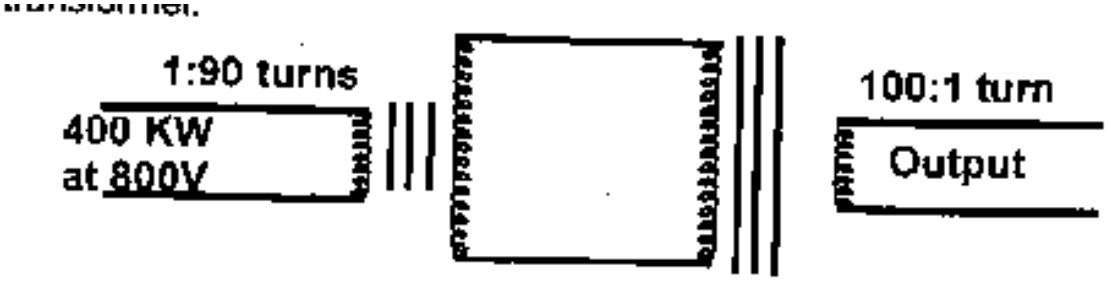
(b)

From the figure above,

(i) Explain how eddy currents generated in the diagram above causes deflection of the pointer (3 mks)

(ii) State tow other ways in which eddy currents are useful (2 mks)

(c) Figure 11 below shows a model power transmission system consisting of a power generator a step – up transformer, transmission cables and a step – down transformers.



The generator produces 400kw at 500v which is fed into transformer T1 whose primary to secondary turns ratio is 1: 90

The power is transmitted through cables whose total resistance is 250y to a stepdown transformer T2. Given that the efficiency of T1 is 100% and that of T2 is 90%, calculate

(i) The current though the primary of T1 (3 mks)

(ii) The voltage across the secondary of T1 (3 mks)

(iii) Briefly account for decline in efficiently of transformer T2 (2 mks)

(iv) Give two sources of mains electricity (2 mks)