**KAHURO/MURANG’A EAST JOINT EXAMINATION – 2016**

**232/1 – PHYSICS PAPER 1 MARKING SCHEME**

1. Mass of A = 0.8χ

Mass of B = 1 x 1000 = 1000g

🗸

🗸

0.96 (1000 + χ) = 1000 + 0.8χ

χ = 250cm³ 🗸

2. High temperature and detergents lowers the surface tension of water. 🗸

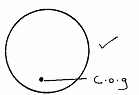
3. Glass is a poor conductor of 🗸 heat. In thick glass, there will be unequal expansion 🗸 but in thin glass heat if conducted evenly.

4. Metal conducts heat away from the flame wood is a poor conductor. 🗸

5. Liquid finds own 🗸 level. Height of water in the three tubes will be the same as Q. 🗸

6. Series connection.

New K = ½ x 4 🗸 = 2N/m 🗸

7.

Position of c.o.g should be as low as possible.

8. The pollen grain particles are hit by (invisible) water particle which are moving randomly.

9. Sum of clockwise moments = sum of anticlockwise moments

F x 1.6 = (1.6 + 2.4)300 🗸

1.6F = 4 x 300



🗸 = 3.5 x 105pa 🗸

10. The balls rise up 🗸 the funnel.

11. Kinetic energy of 🗸 molecules increases therefore molecules move faster. There is a higher rate of collision 🗸 with the walls of the container hence more force.

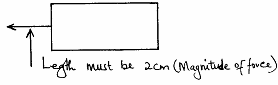
12. h = ½gt²

320 = 1/2 x 105t²

t = 8

Range = Horizontal distance = Ut

50 x 8 = 400m

13.

14. Different gases expand to different extends when temperature increases hence occupy different volumes. Upthrust force acting on he balloons will be different hence the change in equilibrium.

15. To minimize heat loss by radiation. 🗸

**SECTION B: (55 MARKS)**

16. (a) (i) Body must be less dense than water. 🗸

(ii) Body must displace weight of fluid equal to its own weight. 🗸

The density of the body must be less than that of water or

Body must displace weight of fluid equal to its own weight.

(b) (i) Volume of A displaced = 6 x 2 = 12cm³

Mass of A = V = 12 x 10-6 x 800 🗸

Weight of A = Vg = 12 x 10-6 x 800 x 10 🗸

= 0.096N 🗸

1. Volume of B displaced = 6 x 3 = 18cm³

Mass of B = 18 x 10-6 x 1000

Weight = 18 x 10-6 x 1000 x 10

= 0.18N 🗸

1. Total weight = 0.096 + 0.18 = 0.276N 🗸

🗸

🗸 = 657.14kg/m³ 🗸

17. (i) Melting point is 80°C.

(ii) t = 450 – 100 = 350 seconds. 🗸

Q = Pt

= 100 x 350 🗸

= 35000J 🗸

(iii) Q = mlf 🗸

🗸

lf = 350000Jkg¯¹ 🗸

1. - Clay pot

- Sweating.  
- Refrigerator.

1. - Surface area of the container.
   * Humidity.
   * Presence of wind.

18. (a) Sponge reduces impulsive force by increasing the time of impact of force/or it help to spread the impact over a long time.

This reduces impulsive force.

1. Moving air exerts momentum in one direction. 🗸 To conserve the momentum the balloon shoots in the opposite direction

with a momentum equal to but opposite in direction to that of the air.

(c) (i) Total momentum = m1u1 + m2u2

= 150 x 10 + 100 x 0 🗸

= 1500kgm/s 🗸

1. Total momentum after collision = 1500kgm/s 🗸

(iii) Momentum after collision = (150 + 100)V

1500 = 250V 🗸

30 6

 = 6m/s 🗸

51

(d) I (i) 🗸

🗸

🗸

II 

= 50 – 1 x 10 🗸 Correct formula or correct substitution award 1mk

= 40N🗸

III 

= 50 + 1 x 10🗸 Correct formula or correct substitution award 1mk

= 60N 🗸

(ii) At position B; 🗸 - The string is under highest tension at B. 🗸

19. (a) (i) V.R = 2



Distance by DE = 2 x 2 = 4m

1. P.E = Mgh

= 10 x 10 x 2 = 200J 🗸

1. Work done by effort = F x d

= 80 x 4 = 320J 🗸

(iv)  🗸

 🗸

(b) 🗸 

🗸

m = 1800kg 🗸

20. (i) Stirrer. 🗸 Source of heat

(ii) - Volume/length of air column.

- Temperature.

(ii) - Air is tapped by thin mercury thread in a capillary tube. The initial temperature of water is noted and the corresponding volume. 🗸

* + The water is then heated and this in turn heats up the trapped air in the capillary tube. The volume of the air is read and the temperature is recorded.
  + Several values of temperature and corresponding volumes are recorded in a table.
  + A graph of volume against absolute 🗸 temperature is drawn which is a straight line passing through the origin. 🗸
  + An increase in temperature leads to increase in volume. 🗸

**KAHURO/MURANG’A EAST JOINT EXAMINATION – 2016**

**232/2 – PHYSICS PAPER 2 MARKING SCHEME**

**SECTION A: (25 MARKS)**

1. When the switch is closed, the lamps are now in parallel, the resistance in the circuit reduces. 🗸¹ A high current flows and the fuse blows. 🗸¹

2. Light travels in a straight line/

Rectilinear propagation of light. 🗸¹

3. Magnified.

Upright/erect

Virtual Any 2 x 1 = 2mks

4. The gold leaf becomes more positive as a result of attraction of the negative charge towards the metal cap. (2mks tied)

5. Visible light.

6. 0.1cm → 25ms



=15cs 🗸¹

T = 1.5s

🗸¹ 🗸¹

7. A – It has a stronger magnetic field than B.

8. Number of half-life ⇒ 🗸½



Atoms remaining after 3-half-life

= 2.5 x 1019 atoms 🗸½

Atoms decayed = (20 – 2.5) x 1019

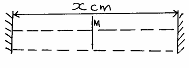
= 17.5 x 1019

= 1.75 x 1020 atoms 🗸¹

9. P-type semi-conductor is made by doping a pure-semi-conductor with group 3 atoms. 🗸¹ The group impurity creates a hole (positive) that attracts an electron for conduction. 🗸¹

10. - Transverse waves forms crests and troughs as they propagate while longitudinal waves forms part of compression and rarefaction. 🗸¹

* Transverse waves moves perpendicular to the direction of wave motion while longitudinal waves moves parallel to the direction of wave motion. 🗸¹

11.

Alternative

Let the cliff be χcm apart   . 🗸¹

Time for 1st echo = 3/2 in 1.5sec.  . 🗸¹

2χ = 990 

χ = 495m 🗸¹ = 1320m . 🗸¹

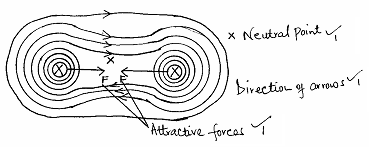
Time for the second echo = 5/2 = 2.5sec.

1.5 + 25 = 4.0sec. 🗸¹

D = 5 x t

= 330 x 4

= 1320m 🗸¹

12.

13. (a) The current flowing through the conductor is directly proportional to the potential difference across its ends provided

temperature and other physical conditions are kept constant.

(b) (i) When the switch is closed the current flows through the coil which offer resistance hence dissipating heat.

1. V = IR 🗸¹

 🗸¹ = 4.8Ω 🗸¹

1. Heat = Vlt 🗸¹

= 12 x 2.5 x 60 🗸¹

= 1800J 🗸¹

1. - Increasing the number of coils. 🗸¹

- Increasing the current. 🗸¹

1. The readings will decrease because the resistance is decreased. 🗸¹

14. (a) - Travel in straight lines at the speed of light.

- Cause ionization.

- They readily penetrate matter.

- Affect photographic films.

- They obey the equation V = fλ

(b) (i) A – Cathode rays/fast moving electrons.

B – Anode.

(ii) Change in heating current 🗸¹ changes the number of electrons produced. 🗸¹

1. Kinetic energy of the cathode rays is converted to heat energy.
2. Tungsten/molybdenum.
3. T – Cathode.
4. To avoid collision between electrons and air molecules.
5. eV = hf 🗸¹

1.6 x 1019 x 24000 = 6.62 x 10-34 x f 🗸¹



= 5.8 x 1018HZ 🗸¹

15. (a) (i) Dispersion of light.

(ii) X – Red

Y – Violet

- Red has the lowest frequency/longest wavelength hence least deviated while violet has the highest frequency/shortest wavelength hence most deviated.

(iii) Act as point source of light.

(b) (i) 🗸¹

🗸¹

= 1.6667 🗸¹

1. C on the diagram. 🗸¹

🗸¹

Sin C = 0.5999

C = 36.86° 🗸¹

(iii) 🗸¹

Sin θ = 1.6667 x 31.2 🗸¹

= 0.8634

θ = 59.7° 🗸¹

16. (a) A transformer uses alternating current while an induction coil uses interrupted direct current.

1. Flux leakage.

Resistance of coil

Eddy currents.

Hysteris loss

(c) (i) Step – Up transformer

(ii) PP = IPVP 🗸¹

= 2.5 x 12

= 30W

(iii) 🗸¹

🗸¹

= 1200V 🗸¹

(iv) 

24 = IS x 1200



= 0.02A

1. - Minimizing energy losses.

- Stepping up lowers the current hence minimizing energy losses.

**KAHURO/MURANG’A EAST JOINT EXAMINATION – 2016**

**232/3 – PHYSICS PAPER 3 MARKING SCHEME**

1. (a) θR = °C (1mk)

(b) D = 0.05m (1mk)

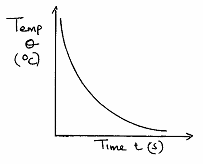
(d) Completing table

Each value (½mk)

Total (3mks)

(e) Plotting (2mks)

Smooth curve (1mk)



1. Table 2

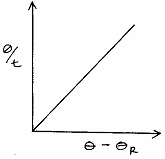
(½mk) per entry

Total (5mks)

1. A graph of slope θ/t against temperature difference (θ - θR).Plotting (2mks)

Straight line (1mk)

Scale (1mk)



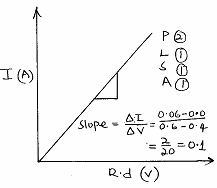
Straight line through the origin.

= \_\_\_\_\_\_\_\_\_\_ (1mk)

2. Table 3

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| I(mA) | 20 | 40 | 60 | 80 | 100 | 120 |
| I(A) | 0.02 | 0.04 | 0.06 | 0.08 | 0.10 | 0.12 |
| p.d(V) | 0.2 | 0.4 | 0.6 | 0.8 | 1 | 2 |

1. Graph of I (A) against p.d (V).





Part B

D = 15cm

= 0.15m







