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232/1
PHYSICS
PAPER 1
(Theory)
July/August – 2009
Time: 2 Hours

INTERZONAL

Kenya Certificate of secondary Education
Physics
Paper 1
July/August – 2009
Time 2 Hours

SECTION (45 MARKS)
Answer all questions in this paper

- All work must be clearly shown
- Mathematical tables (KNEC) may be used and Non programmable .
- Silent electronic calculator may be used except where stated otherwise.

1. The micrometer screw gauge represented by figure 1 has thumble scale of 50 divisions. What is the reading shown? (1 mark)

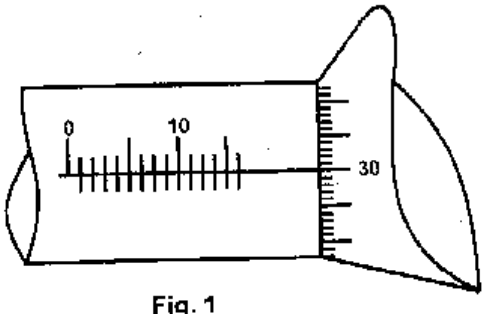


Fig. 1

2. What measurable quantity is associated with colours of light? (1 mark)

3. State two factor that should be controlled in manufacturing a cylindrical container of uniform thickness which should normally be in a standing position?

(2 marks)

4. Fig 2 shows a U – tube containing two liquids L_1 and L_2 of densities $0.8gcm^{-3}$ and 1.8^{-3} gcm respectively in equilibrium.
Given thath_2 = 8cm determines the value of h_2 (3 marks)

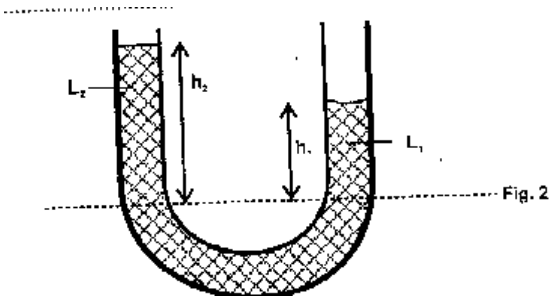


Fig. 2

5. A small nail may pierce an inflated car tyre and remain there without pressure reduction in the tyre. Explain the observation (2 marks)

6. Give a reason why a concrete beam reinforced with steel does not crack when subjected to changes in temperature (2 marks)

7. Give a reason why heat transfer by radiation is faster than heat transfer by conduction (2 marks)

8. A vertical object placed on a bench is observed to have three shadows of different sharpens in different direction. Explain this observation. (3 marks)

9. State the law of electrostatic charges (1 mark)

10. The pitch of the note produced by a wire depends on the length and the tension in the wire. State other factors that affect the pitch. (1 mark)

11. Name two factors that determine the shape of a liquid drops on a solid surface (2 marks)

12.

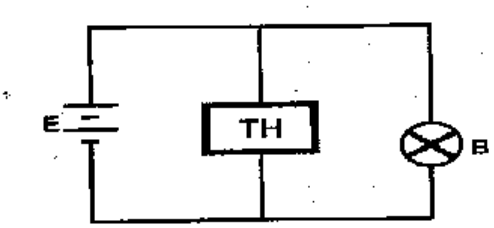


Fig. 3

A thermistor, TH is connected in parallel with a bulb as shown above in figure 3. The bulb is lit. When the thermistor is steadily heated the brightness of the bulb reduces. Explain this observation

13.

Figure 4 shows tow parallel current carrying conductors A and B placed close to each other. The direction of the current into the plane of the paper.
On the same figure
(i) Sketch the magnetic fields pattern
(ii) Indicate the force F due to the current on each other conductor
(1 mark)

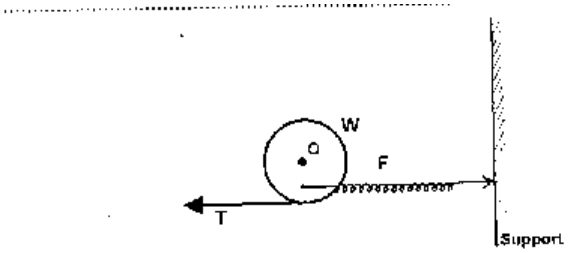


Figure 5 shows a wheel W pivoted at its centre O and held station by a string and a spring. The tension in the string is T and the force on the spring is F.
Use this information to answer question 14 and 15.

14. State hoe the magnitudes of T and F compare. Give reason for your answer
(3 marks)

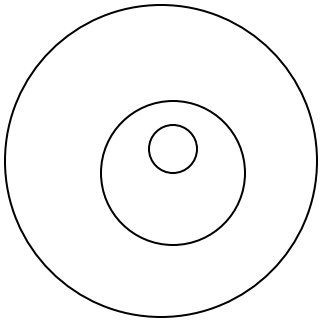
Section B (35 Marks)

Answer all questions in this section

15. State what would happen to the wheel if the string is snapped (1 mark)

16. Sketch in the spaces provided below, a labeled diagram to show how an arrangement of a single pulley may be used to provide a mechanical advantage of 2 (2 marks)

17. Circular water waves generated by a point source at the centre, O of the pond are observed to have the pattern shown in figure 6



Explain the pattern (2 marks)

18. What characteristic of sound is applied in tuning pianos? (1 mark)

19. In a large current large resistors in parallel are preferred to low resistors in series Explain (2 marks)

20. A girls heated 5 kg of water to a temperature of 80^0 C. when she added m kg of water at 15^0 the mixture attains a temperature of 40^0C. Determine the value of m. (ignore heat change due to the container) (3 marks)

21. Equal masses of water and paraffin with specific heat capacities Cw and Cp respectively are heated using identical sources of heat, for the same length of time. The final temperature, op of paraffin was found to be greater than final temperature, Ow of water. Show that Cw greater than Cp (3 marks)

22. A lady hold a large concave mirror of focal length 1 m, 80cm from her face. State two characteristics of her image in the mirror (2 marks)

23. A small object lies in the bottom of water pond at a depth of 1.2m. Given that the refractive index of water is 1.3, determine the apparent depth of the object. Give your answer to 1 decimal place) (3 marks)

24. State how the pressure in a moving fluids varies with the speed of the fluid
(1 mark)

25. In some petrol engines where spark plugs are used, a capacitor is connected to the distributor. Suggest the function of the capacitor (1 mark)

26. A house in which a cylinder containing cooking gas is kept unfortunately catches fire. The cylinder explodes. Give an explanation for the explosion (2 marks)

27. Explain how a piece of a Polaroid reduces the suns glare (1 mark)

28. Figure 6 shows a measuring cylinder which contains water initially at level A solid of mass 11g is immersed in the water, to water level rises to B

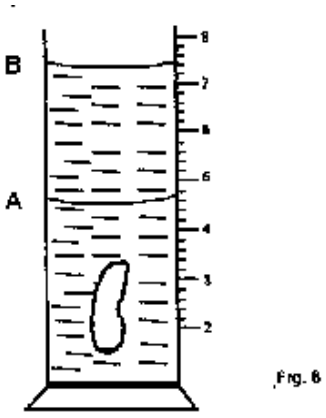


Fig. 6

Determine the density of the solid. (Give your answer to 1 decimal point)
(3 marks)

29. A solid copper sphere will sink in water while a hallow copper sphere of the same mass may float. Explain this observation (2 marks)

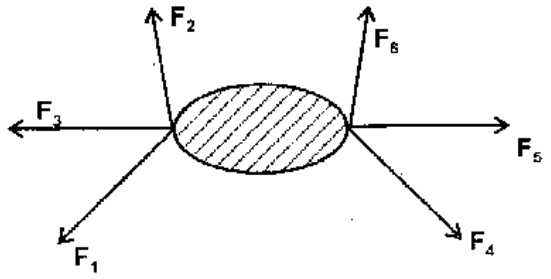
30. The moment of the weight of a vertical door does not significantly affect the moment of the force required to open the door. Give a reason for this (1 mark)

31. What cause electromagnetic dumping in a moving coil galvanometer (1 mark)

32. The control grid in a cathode Ray Oscilloscope (CRO) is used to control the brightness of the scream. How is this achieved? (2 marks)

33. A – particles are more ionizing the B-particles. Give one for this (1 mark)

34. Figure 7 shows a rigid body acted upon by a set of forces. The magnitudes of the forces are as follows
$F_1 = 3N, F_2 = 6N, F_3 = 3N, F_4 = 4N, F_5 = 3N$ and $F_6 = 3\ N$



Identify the couple among these forces (1 mark)

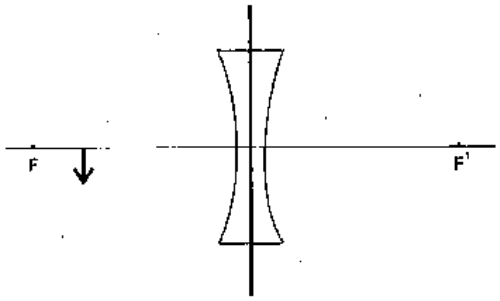
35. Give a reason why the weight of a body varies from place to place (1 mark)

36. A butcher has a beam balance and masses 0.5kg and 2kg. How would he measure 1.5kg of meat on the balance at once? (1 mark)

37. The height of the mercury column in a barometer at a place is 64cm. What would be the height of a column of paraffin in a barometer at the same place?
(Density of paraffin ($8.0 \times 10^2\ kgm^{-3}$) (3 marks)

38. In the Brownian motion experiment, smoke particles are observed to move randomly Explain how this motion is caused. (2 marks)

39. Figure 8 shows an object) placed in front of a concave lens with principal focii F and F^1. Construct a ray diagram to locate the position of the image (3 marks)

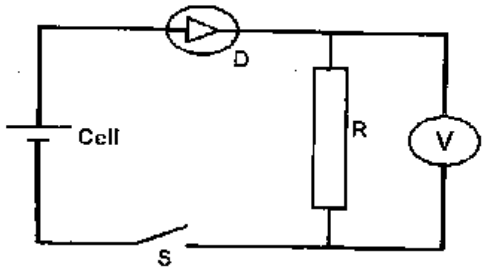


40. A heating coil rared 1000w takes 15 minutes to heat 20kg of a liquid from 26^0 to 42^0 c. Determine the specific heat capacity of liquid (3 marks)

41. A metal pin was observed to float on the surface of pure water. However the pin sank when a few drops of a soap solution were carefully added to the water explain the observation (2 marks)

42. Cleavage in crystals in possible in certain directions only
Explain this observation (2 marks)

43. In the circuit in fig. when the switch S is closed, the voltmeter shows a reading



When the cell terminals are reversed and the switch is closed the voltmeter reading is zero. Explain these observations (3 marks)

44. Fig 9 shows a tall jar containing two fluids A and B. The viscosity of A is higher than that of B. A solid sphere is released at the top of the jar and falls though the fluids.

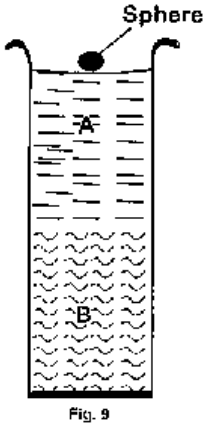
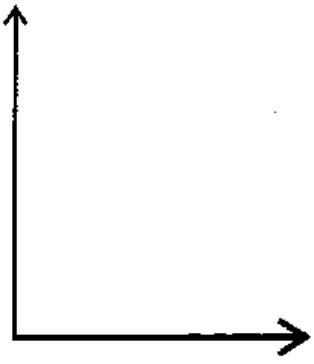


Fig. 9



On the axes provided, sketch the velocity – time graph for the motion of the sphere though the fluids (2 marks)

45. A body of mass M is allowed to slide down an inclined plane. State tow factors that affect its final velocity at the bottom of the incline (2 marks)