YEAR 2009 PAPER 1: 29 OCTOBER 2009: PAPER 1

1. All measurable features or properties of objects are called ...

   A. SI units.

   B. measurements.

   C. physical quantities.

   D. images.

2. Which of the following numbers has four significant figures?

   A. 0.0002

   B. **0.0020**

   C. 0.0200

   D. 0.2000

3. A motorist travels 320km at 80km/h and then 320km at 100km/h. What is the average speed of the motorist for the entire trip?

   A. 84km/h

   B. 89km/h

   C. 90km/h

   D. 91 km/h

4. A stone of mass 400g is lowered into a measuring cylinder containing water. The water level rises from 30Qcm^3 to 500cm^3. What is the density of the stone?

   A. 0.50g/cm^3

   B. 0.80g/cm^3

   C. 1.33g/cm^3

   D. 2.00g/cm^3

5. A force acts on a mass of 1kg producing an acceleration of 1m/s^2. This force is called • • •

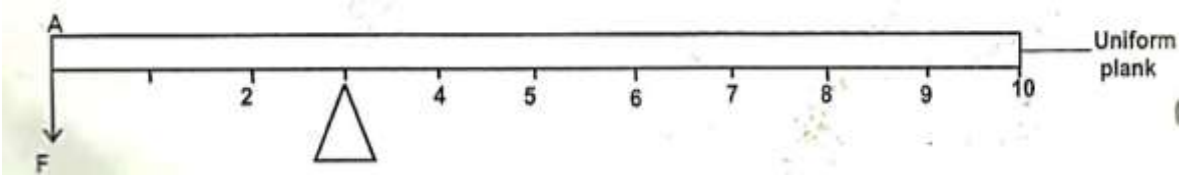
   A. tension (T)

   B. Newton (N)

   C. weight (W)

D. friction (F)

6. A uniform plank of length 10cm is in equilibrium as shown in the figure below.



A force of 100N is applied at point A in the direction shown. What is the weight of the plank?

A. 50N

B. 100N

C. 150N

D. 200N

7. A ball of mass 5kg moves vertically upwards from ground level till it reaches a maximum height of 4m. What is its Kinetic energy when it is halfway up? Assume g = 10m/s^2.

A. 5J

B. 50J

C. 100J

D. 200J

8. The Kelvin temperature of a liquid is 300K. Its temperature in °C is ...

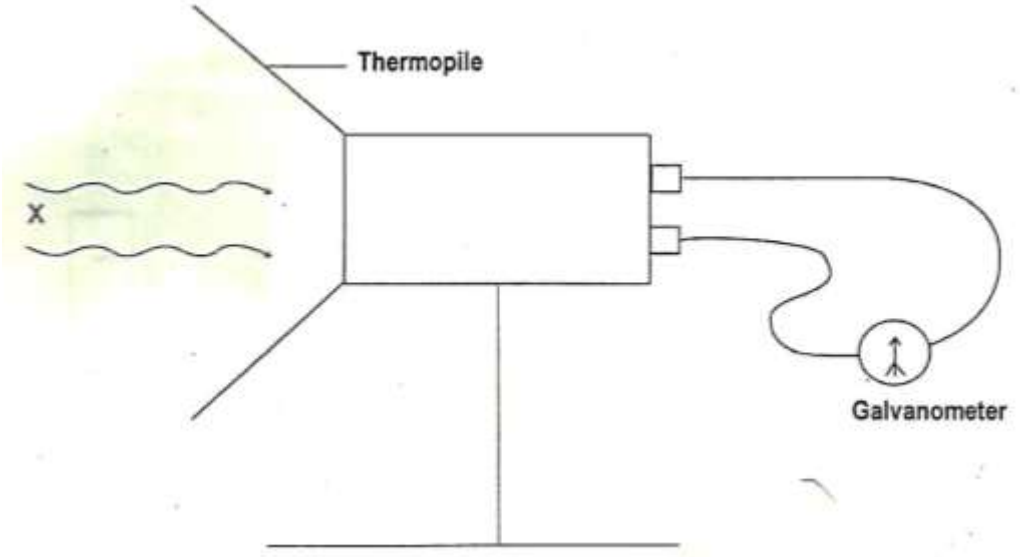
A. 27

B. 57

C. 100

D. 273

9. An experiment is arranged as shown below.



X is a radiation entering the thermopile. If the galvanometer needle shows a deflection,

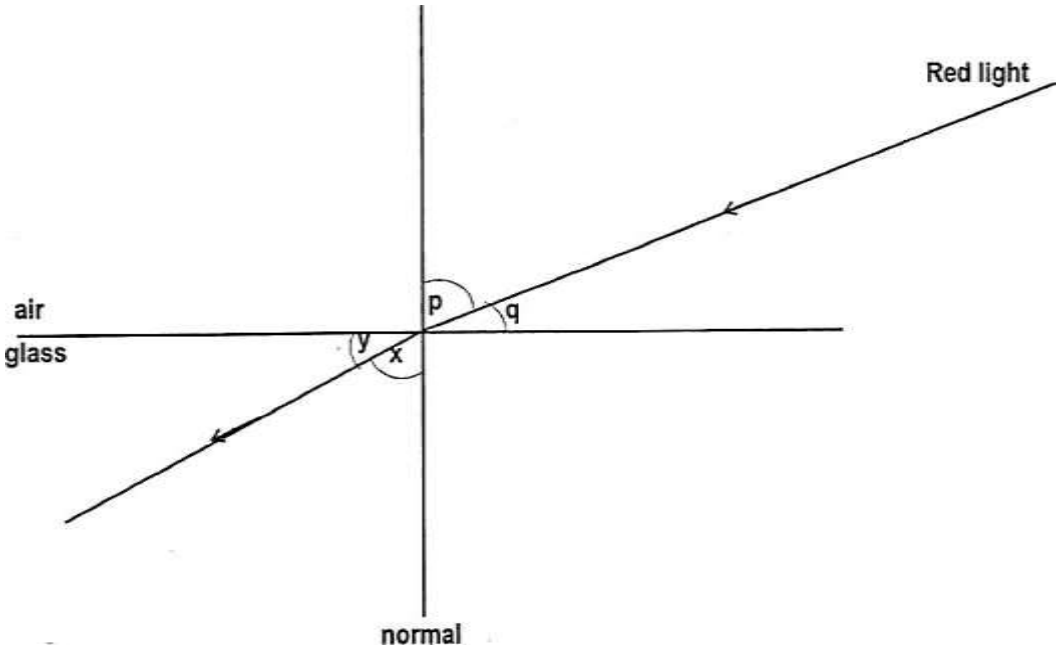
A. X has a shorter wavelength than X-rays.

B. X has a longer wavelength than X-rays.

C. X has a lower frequency than Radio waves.

D. X has the same frequency as light

10. The diagram shows a ray of red light passing from air into glass.



Which ratio gives the refractive index for red light?

A. $\frac{\sin p}{\sin x}$

B. $\frac{\sin p}{\sin y}$

C. $\frac{\sin q}{\sin x}$

D. $\frac{\sin p}{\sin y}$

11. A loud sound is made in front of a tall building. An echo is heard 4 seconds after the sound is produced. If the speed of sound in air is 320m/s, how far away is the building?

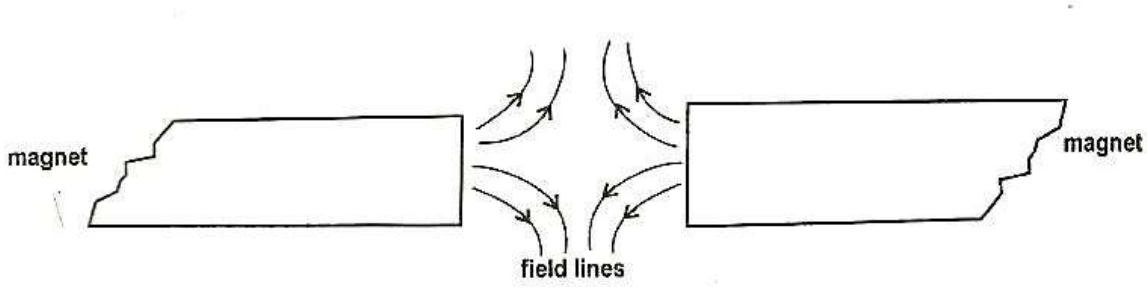
    A. 80m

    B. 160m

    C. 640m

    D. 1280m

12. The figure below shows the magnetic field lines on two pieces of permanent magnets.



The field pattern is produced by ...

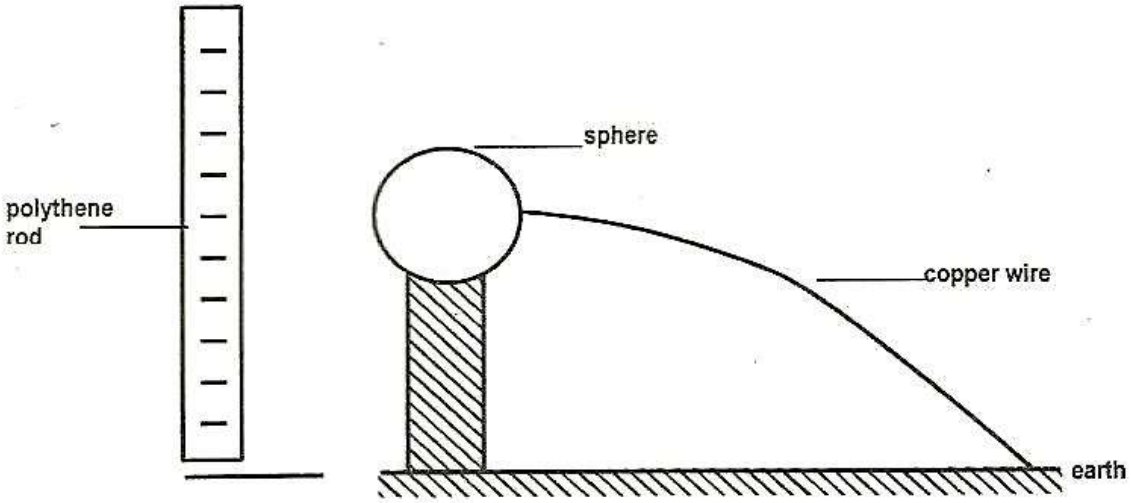
    A. A two north poles

    B. two south poles

    C. a north pole and a south pole

    D. a south pole and an unmagnetised iron bar.

13. The figure below shows a negatively charged polythene rod getting closer to a metal sphere which is on an insulator. A copper wire connects the sphere to the Earth.



Which of the following is true?

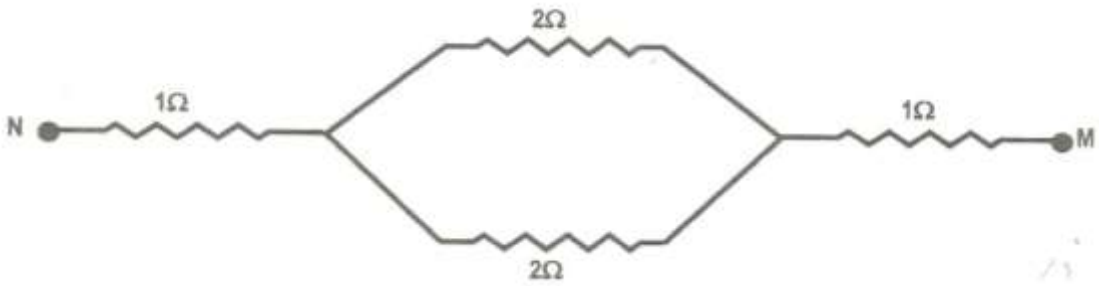
A. A Current flows from the Earth to the sphere

B. Current flows from the sphere to the Earth

C. The sphere is negatively charged

D. The Earth is at a positive potential

14. The figure below shows part of a circuit in which current is flowing.



If the p.d between **N** and **M** is 3V, the current is

A. **1A**

B. 3A

C. 6A

D. 12A

15. A heater used on a 250V mains circuit has a 5A fuse in its plug. Which is the highest power rating for this heater?

A. 50W

B. 1000W

C. 1250W

D. 2000W

16. Induced current is such that it opposes the change which is causing it. This is ...

A. Ohm's law

B. Snell's law

C. Faraday's law

D. Lenz's law

17. Which of the following may not help to minimise the energy losses in a transformer?

A. Using thicker copper wire

B. Using thinner copper wire

C. Using a laminated iron ore

D. Ensuring an efficient core design

18. Which of the following is **not** a correct statement about cathode rays?

A. They have a positive charge

B. They travel in straight lines

C. They are streams of electrons

D. They are deflected by magnetic and electric fields

19. The radium nucleus. ${}^{226}_{88}Ra$ decays to Radon (Rn) as shown below

$${}^{226}_{88}Ra \rightarrow X + {}^{222}_{86}Rn$$

X is …

A. an X-ray

B. a gamma-ray

C. a Beta particle

D. an alpha particle

20. Compared to the charge and mass of a proton, an electron has ...

A. the same charge and a smaller mass

B. the same charge and the same mass

C. an opposite charge and a smaller mass

D. an opposite charge and the same mass