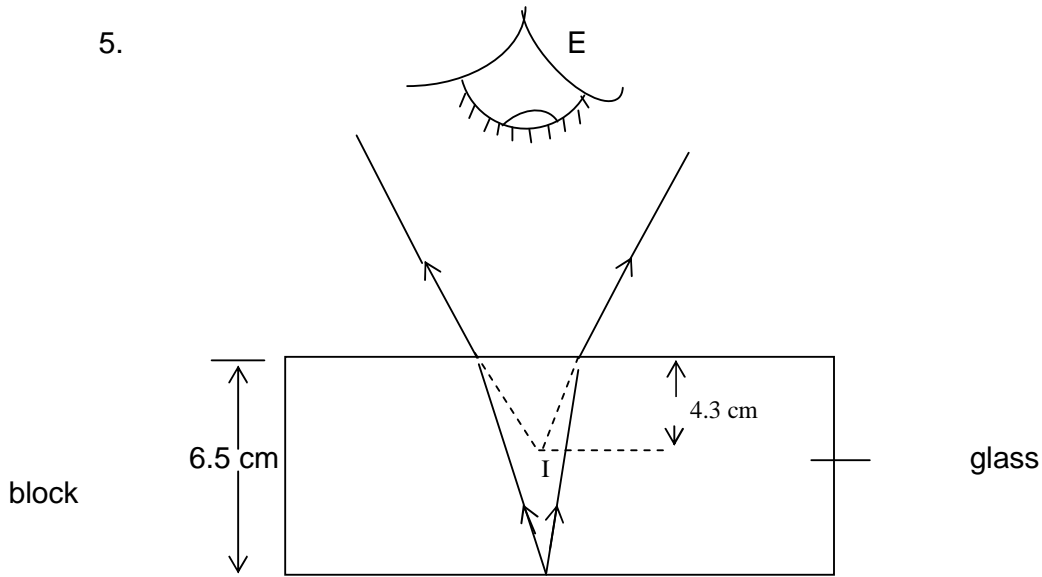


- Echoes of sound waves are caused by
A: refraction B: interference C: reflection D: diffusion
- Which of the following is not primary cell?
A: simple cell B: lead acid cell
C: button cell D: dry cell leclanche cells
- Which one of the following is not a way of transmission of a radio wave?
A: internal waves B: space waves
C: ground waves D: sky waves
- Magnetic saturation is a state where by a magnet
A: can acquire more magnetism
B: has acquired excess magnetism
C: can not be demagnetised by any means
D: has acquired maximum magnetism

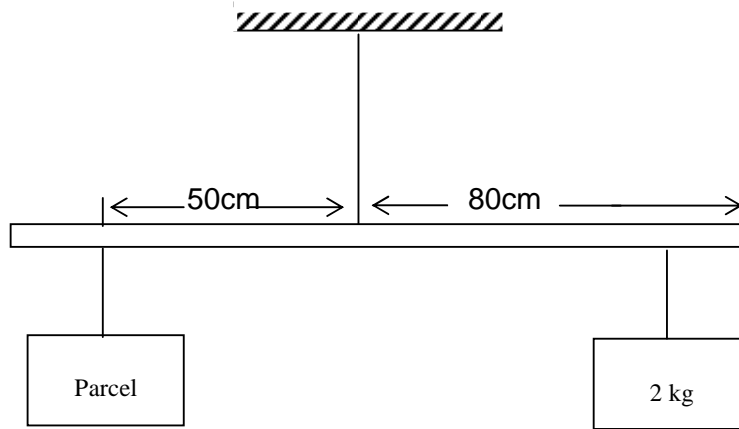


The figure above shows a glass block placed on an object O. An observer at E sees the object at I. Calculate the refractive index of glass.

- A: 0.661 B: 1.33 C: 1.43 D: 1.51
- For a given mass of a gas at constant temperature,
A: the pressure increases when the volume is increased
B: the pressure remains constant when the volume is increased
C: the pressure increases when the volume is decreased
D: the volume remains constant when pressure is increased
 - Paraffin moves up the wick of a candle by a process called
A: Osmosis B: surface tension C: capillarity D: transpiration

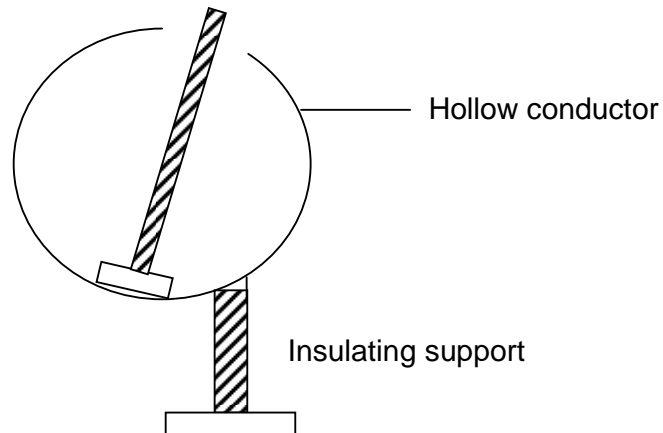
12. A crane lifts a mass of 28kg through a height of 20m in 25 seconds.
Calculate the power of the crane
A: 22.4w B: 35.0w C: 224w D: 350w

13.

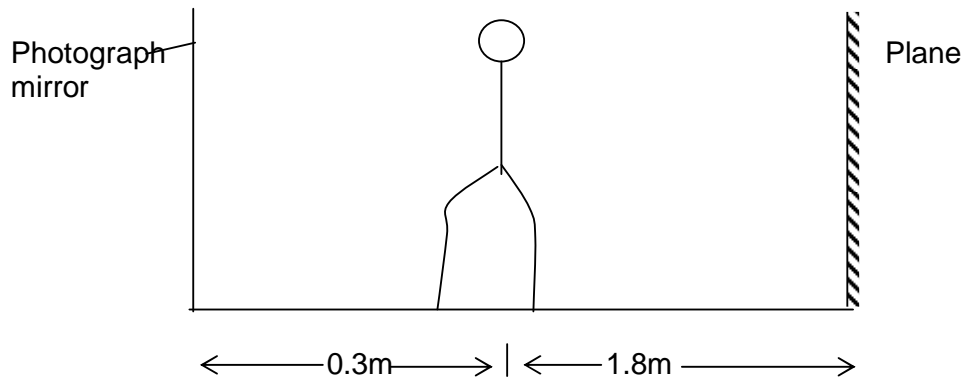


A man balanced a parcel with a 2.0 kg bag of flour using a horizontally suspended uniform broom handle as shown above. Calculate the mass of the parcel.

- A: 12.5 kg B: 10 kg C: 40 kg D: 32. kg
14. Which of the following is not an application of radioactivity?
A: welding worn out parts of machinery
B: detection of wear and tear in machinery
C: carbon dating
D: radiography
15. The following are applications of electromagnets except
A: magnetic relay B: electric motor
C: telephone receiver D: electric bell
16. The hollow conductor shown below is charged positively by induction

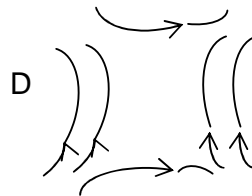
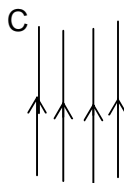
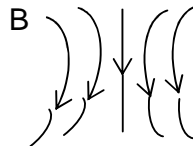
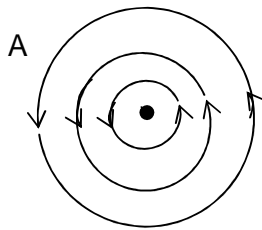


25. The figure below shows a boy standing between a photograph and a mirror at the distances indicated



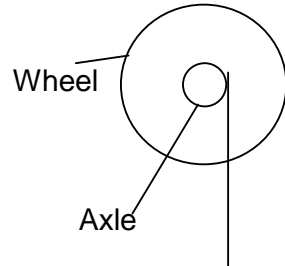
The distance between the boy and the image of the photograph in the mirror is

- A: 0.3m B: 1.8m C: 3.6m D: 3.9m
26. The volume of a fixed mass of a gas at 12°C and pressure 100kpa is 40cm^3 . Calculate the volume of the gas at 40°C and pressure 120kpa.
- A: 18.6cm^3 B: 30.4cm^3 C: 36.6cm^3 D: 33.8cm^3
27. An immersion heater of power 1500w is used to melt 250g of ice at -10°C and raise the temperature of the water formed at 25°C . Calculate the time taken in seconds
- A: 110.8 B: 73.9 C: 27.3 D: 13.65
28. Which of the following magnetic fields would be inside a long solenoid carrying direct current?



29. A gun fires a bullet of mass 20g at a velocity of 800m/s. Calculate the mass of the gun if its recoil velocity is 3.2m/s
 A: 4.5 kg B: 5.0kg C: 6.0kg D: 50.0kg

30.



- The figure above is a wheel and axle in which the diameter is 75cm and that of the axle is 30cm. Calculate the velocity ratio of the system
 A: 0.4 B: 2.5 C: 22.5 D: 150

31. The core of a transformer is laminated in order to reduce
 A: back emf B: contraction and expansion
 C: Eddy currents D: output current
32. The half-life of a radioactive particle is 20 minutes. How long will it take 50g of the substance to decay to 6.25g
 A: 60 minutes B: 40 minutes C: 20 minutes D: 10 minutes
33. A body is thrown vertically upwards with an initial velocity of 60m/s. Calculate the maximum height reached.
 A: 180m B: 120m C: 60m D: 30m

In each of the following questions, more than one answer is correct. Read each question carefully and then write the correct answer A, B, C, D according to the following instructions.

- A: if 1,2,3 are correct
 B: if 1,3 only are correct
 C: if 2,4 only are correct
 D: if 4 only is correct

34. The nuclide ${}^{12}_{6}\text{C}$ has
1. mass number 20
 2. eight neutrons in the nucleus
 3. atomic number 14
 4. six electrons orbiting the nucleus

35. Which of the following statements is/are true about hard x-rays
1. they are of very short wavelength
 2. they have a low penetrating power
 3. they have very high frequency
 4. their velocity is higher than that of light
36. The eye is similar to a photographic camera in a way that
1. both form elect images
 2. both have concave lenses
 3. both have the ability to control size of the lens
 4. both have the ability to control the amount of light entering
37. electrons can be produced
1. hammering a metal
 2. heating any substance
 3. rubbing two surfaces together
 4. shining ultraviolet light onto a zinc plate.
38. Isotopes of an element have
1. same atomic number
 2. same number of electrons
 3. similar chemical properties
 4. same mass number
39. when water spreads on a glass plate, the forces between its molecules and glass molecules are due to:
- | | |
|--------------------|-------------------------|
| A: surface tension | B: cohesion |
| C: Adhesion | D: capillary attraction |
40. Disposition of light is
- A: the rectilinear propagation of light
 - B: changing of direction of light when it moves from one medium to another
 - C: splitting of white light into constituent colours
 - D: reflection of light into different direction

SECTION

41. (a) Define relative density

.....

.....

.....

(b) A metal cylinder weighs 5N in air and 4.2 N in a liquid of density 800kg/m³. Calculate the relative density of the metal.

42. (a) What is meant by

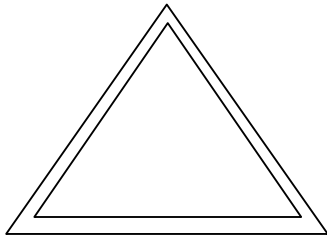
(i) a tie?

.....
.....
.....

(ii) A strut?

.....
.....
.....

(b)



The figure above is an incomplete structure of a root. Complete the structure by adding two beams to straighten it

(c) State one advantage of a hollow cylindrical beam over a solid cylindrical beam

.....
.....

43. (a) Define the terms as applied to waves:

(i) amplitude

.....
.....

(ii) periodic time

.....
.....

(b) A radio wave has a frequency of 55MHz. Calculate the periodic time of the wave

44. (a) State two advantages of a .c over d.c power transmissions.

(i).....

.....

(ii).....

.....

(b) State two ways in which energy may be lost in a transformer

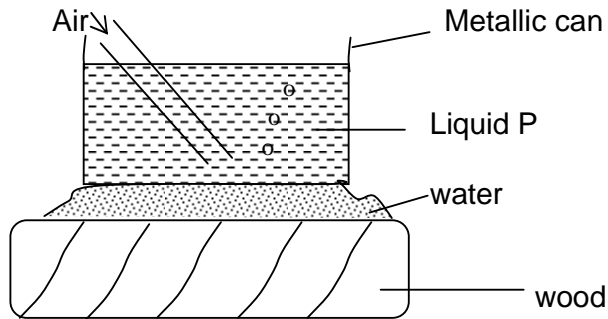
(i).....

.....

(ii).....

.....

45.



(a) Air is blown into a liquid p, of low boiling point as shown above

(i) State what is observed after along time

.....

.....

.....

.....

(ii) Explain your observation in (a) (i)

.....

.....

.....
.....

(b) A liquid is heated to 120°C and allowed to cool. It starts solidifying after 5 minutes when its temperature is 80°C and takes 10 minutes to solidify sketch the cooling curve for the liquid

46. (a) State two factors which affect the strength of an electromagnet

(i)

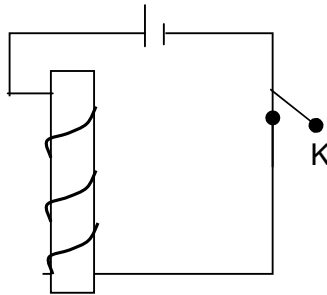
(i).....

.....

(ii)

(ii).....

(b)



The diagram above shows a small magnet placed near an electromagnet. Describe what happens to it when k is closed

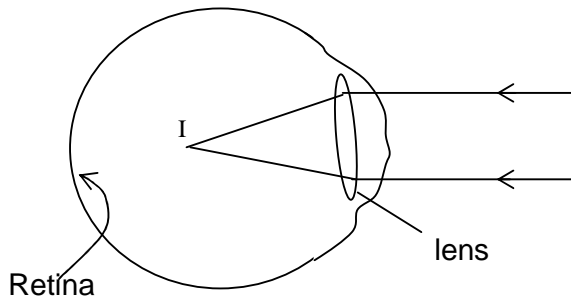
.....

.....

.....

.....

47.



The figure above shows refraction of light rays from a distant object by a human eye.

(a) Explain where the eye is able to see the object clearly

.....

.....

.....

(b) What is meant by accommodation?

.....

.....

.....

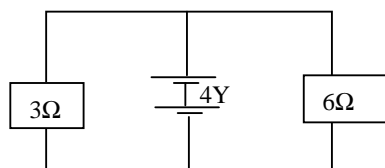
48. (a) State Ohm's law

.....

.....

.....

(b)



Two resistors of resistances 3 and 6 are connected across a battery of 4V of negligible internal resistance as shown above. Find

(i) combined resistance

(ii) current supplied by the battery

49. (a) State Archimede's principle

.....
.....
.....
.....

(b) A rubber balloon of mass 5×10^{-3} is inflated with hydrogen and held stationary by means of a string. If the volume of the inflated balloon is $5 \times 10^{-3} \text{ m}^3$, calculate the tension in the string

50. An object 4cm^3 is placed vertically on the principle axis of a converging lens of focal length 8cm. If the object is 32cm from the lens,

(a) locate, by graphical method, the position of the image using the graph provided

(b) Find the magnification of the image.