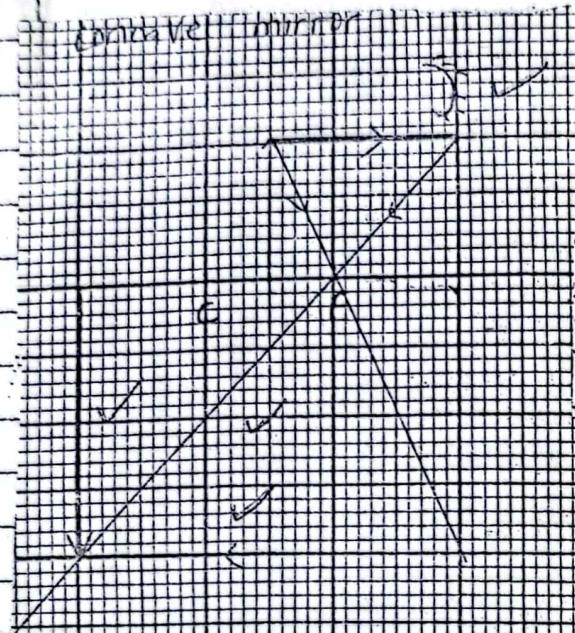


RESPONSES

QUESTION

9

Convex lens diagram



$$M = \frac{V}{U}$$

✓

Accept

$$\text{or } M = \frac{\text{Image height}}{\text{Object height}}$$

$$= \frac{30}{15} \quad \text{or}$$

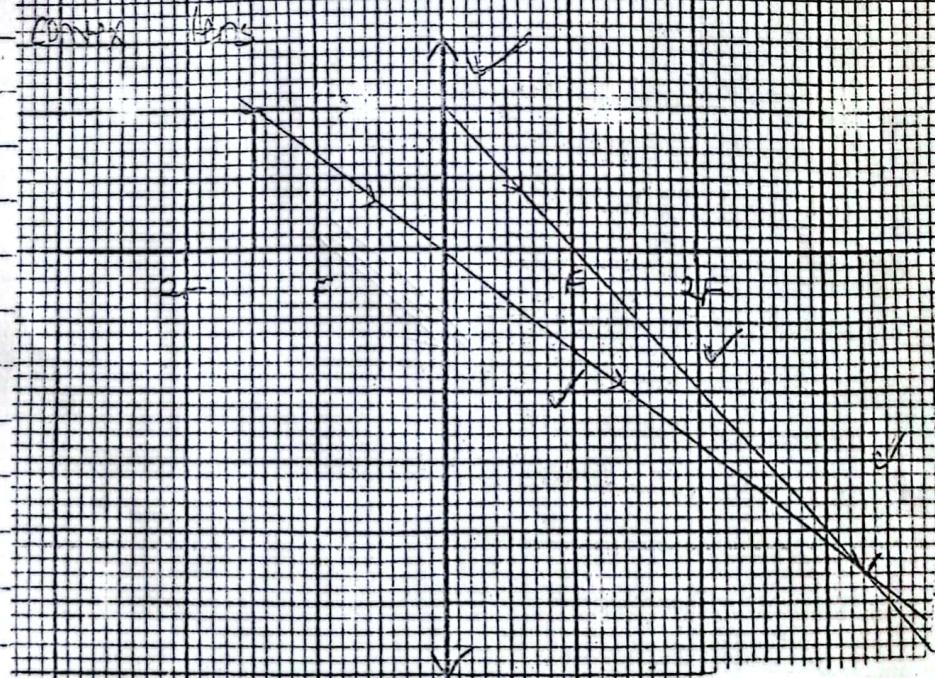
$$= 2 \quad \checkmark$$

$$f = \frac{r_1}{2}$$

mention
the position

correct image position $f < V < 2f$
implies correct use of
scale.

Convex lens



$$M = \frac{V}{U} = \frac{33}{15} = 2.2 \quad \checkmark$$

The magnification
will determine
the best answer

- If the magnification
is same
accept any of
these.

The nurse should use a convex lens since it
has a bigger magnification. ✓

b) Sound waves can travel through solid objects like walls! Sound is a form of energy that travel through a medium like air, solid or water.

When someone makes a sound inside a room, sound waves created by that person travel through air in the room and cause walls to vibrate. These vibrations are

15+1

ITEM 2

✓ R is a suitable radioactive source because it emits β^- particles which penetrate the soil and emerge from the ground.

It has sufficiently long half life for the work of the detection to be carried out and this half life is not too long. ~~and highly soluble in water~~

After a period of two days, the activity of the source will be weak enough not to pose any danger.

R has a high solubility and be readily dissolved in water.

Geiger muller tube is most suitable. It is a very sensitive detector.

It is portable. (It can be carried from place to place).

It has a scalar or ratemeter which gives count rate directly.

The scalar measures the number of counts over a period of time.

Cure 2 mes
on not too long
half life or short
half life

Accept: After a short period the water will be safe for use.

b The leakage in pipes is detected by.

Using β^- radiations which are dissolved in water.

A Geiger-muller tube with the ratemeter is moved along the ground, above the underground pipes.

A large increase in the count rate will indicate that a leakage has been detected.

15 H

ITEM 3.

9 The earth rotates around the sun. It takes the earth 24 hours (one day) to rotate about its axis and 365 days (one year) to revolve about the sun.

As the earth rotates on its axis, the side which faces the sun receives light and this side therefore experiences day time ✓

The other part of the earth is in a cooler and darker region. This side experiences night time ✓

b. The earth is tilted on its axis at an angle. The region which is tilted towards the sun experiences summer. If it's the Northern hemisphere that experiences summer, then the Southern hemisphere experiences winter, because it is tilted away from the sun.

Accept 366 days.

Duration

- day has 24 hours

- A year has

365 or 366 days

Tides are periodical rises and falls of large water bodies ~~MAR~~

Tides are caused by the moon's gravitational pull. The tidal force causes the earth and its water to bulge out on the sides closest to the moon and the side farthest from the moon. These bulges of water are high tides ✓

15

3c Artificial satellites are man-made satellites orbiting the earth.

These are used for in

- Navigation (GPS) ✓
- Weather forecasting ✗
- Broadcast
- Earth observation
- Scientific research

define
Any 2 of 5 - 02
correct

Give me to the
definition and

Mark to my
correctly stated
role

15 + 1

11CM 11.

a)



$$A = 18.380 \text{ cm}^2$$

Volume of

$$\text{the tank} = \pi r^2 h = Ah$$

$$= 18380 \times 5.5$$

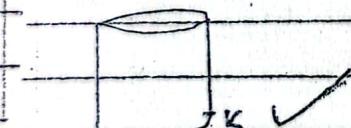
10000

$$= 10.109 \text{ m}^3$$

Since the volume of the tanks is 10.109 m^3 , both can store 10 m^3 of water.

ii) Since the water should be kept warm, the tank painted white should be used. This is because white will reflect the heat back inside the tank thus keeping the water warm.

White black is a good emitter of heat energy so the water will be cold.



Accept tap drawn at the bottom

The tap should be put at K because height of water above it will exert more pressure hence the water flowing out very fast. This is due to the fact that pressure increases with depth.

c) Fix the stands on concrete ground wide base of stands.

Any 2 correct
Ans correct

The tank stand should have a tower structure.

More struts and ties

He can use steel material to make the stands since steel is strong, weather resistant and durable.

15+1

ITEM 5

a. The passengers jack backward and forward due to inertia. This is the tendency of a body to remain at rest or if moving, to continue its motion in a straight line.

Ans: Inertia

b. The bonnet was hot because heat was transferred to it from the engine through radiation. Radiation is the transfer of heat by electromagnetic waves.

The space between the bonnet and the engine was heated; this heat was transferred to the bonnet thus becoming hot.

$$\begin{aligned}
 \text{C. Total distance} &= \frac{1}{2}bh + l \times w + \frac{1}{2}bh \\
 &= \frac{1}{2} \times 4 \times 200 + 4 \times 200 + \frac{1}{2} \times 4 \times 200 \\
 &= 1400 \text{ km.}
 \end{aligned}$$

$$\begin{aligned}
 A &= \frac{1}{2} h (a+b) \\
 A &= \frac{1}{2} \times 200 \\
 &\quad \times 4 \\
 &= 400 \\
 A_1 &= l \times w \\
 &= 4 \times 200 \\
 &= 800 \\
 A_2 &= \frac{1}{2} bh \\
 &= \frac{1}{2} \times 4 \times 200 \\
 &= 400
 \end{aligned}$$

The taxi driver should tell the mechanic to find them at a distance of 1400 km.

$$\begin{aligned}
 A_1 &= \frac{1}{2} bh \\
 &= \frac{1}{2} \times 4 \times 200 \\
 &= 400
 \end{aligned}$$

$$\begin{aligned}
 16 &= 400 + 800 + 400 \\
 &= 1600
 \end{aligned}$$

$$\begin{aligned}
 T &= 400 + 800 + 400 \\
 &= 1600
 \end{aligned}$$

ITEM 6

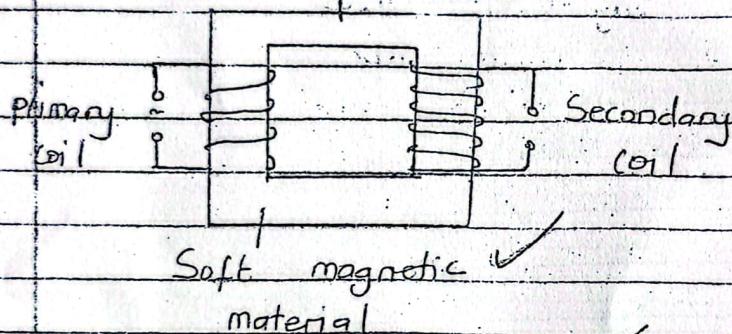
a. The bulbs are in parallel connection.
In parallel connection the p.d of 240V will be across each bulb and the effect of one bulb does not affect others. This is why two rooms had light when it was not lighting in the other room.

The fault of the bulb A does not affect the working of other bulbs in other rooms because of parallel connection

b. A transformer is a devise that steps up and down alternating current voltage

How it works

laminated soft iron core



Any correct two labelled parts

An alternating current is passed through the primary coil, an alternating magnetic flux will be set up through the iron and will induce an alternating emf in the secondary coil.

Emf in the secondary coil V_s is obtained from $\frac{V_s}{V_p} = \frac{N_s}{N_p}$ where V_p is

the emf in the primary coil of N_p turns and N_s is number of turns in the secondary coil.

6c. Heat supplied by = Heat required to
the heating coil raise temperature.

Accept passing through
current $V=IR$ ~~current has no effect~~

$$VIt = mc\theta$$

$$Pt = mc\theta$$

$$\sqrt{2}t \checkmark = 1 \times 4200 \times (100 - 15)$$

R where $m = 1\text{kg}$.

$$240^2 t = 4200 \times 85$$

40

$$1440t = 357000$$

$$t = 357000$$

1440

$$t = 247.9 \checkmark \text{seconds}$$

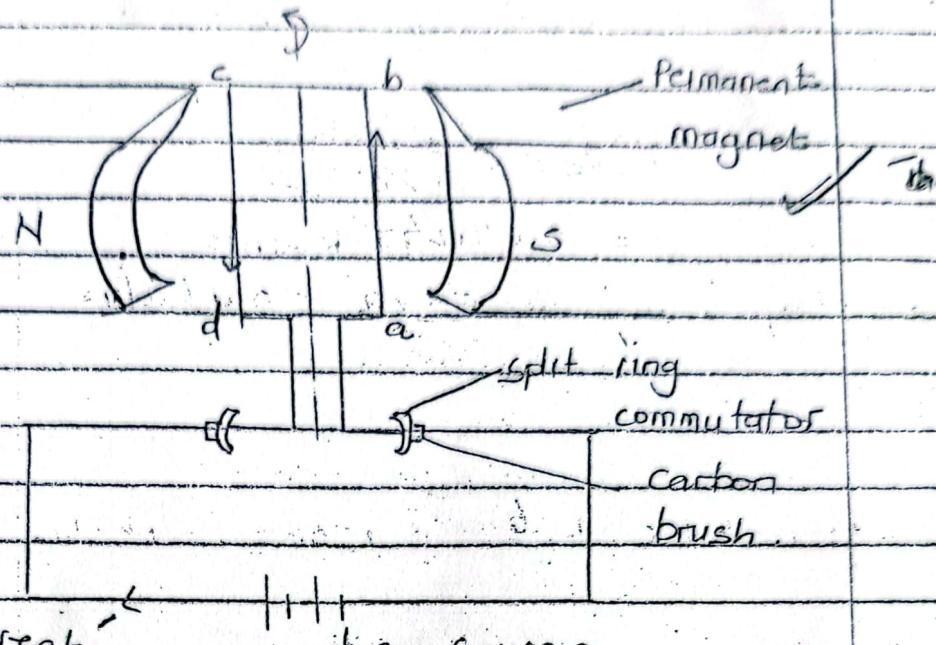
\approx 4 minutes and 8 seconds

The kettle was okay since the time taken for the heat to be supplied by the coil was equal to the one given in the question.

15+1

ITEM 7

A motor is a device that converts electrical energy to mechanical energy ✓



Current \leftarrow dc source

When current flows in the coil, ab experiences an upward force and cd a downward force in accordance to Fleming's left hand rule. ✓

The forces form a couple which rotates the coil until it is vertical.

In this position commutators are disconnected from the brushes and no current flows in the armature.

Momentum of the coil makes it go after interchanging commutators and the direction of current reverses in the coil. ✓

The cycle repeats continuously as the motor does work. ✓

b. Number of units per day

For the flat iron, $75 \times 1 = 0.075 \text{ kWhrs}$

$\frac{1000}{1000}$

For the TV: $2 \times 100 \times 4 = 0.8 \text{ kWhrs}$

$\frac{1000}{1000}$

Phone charging $2 \times \frac{50}{1000} \times \frac{65}{60}$

$\frac{1000}{60}$

$$= 0.091667 \text{ kWhrs}$$

Lighting bulbs $= 4 \times \frac{50}{1000} \times 2 = 0.4 \text{ kWhrs}$

$\frac{1000}{1000}$

Total number of units per day

$$0.075 + 0.8 + 0.091667 = 1.366667 \text{ kWhrs}$$

$$0.075 + 0.8 + 0.091667 + 0.4 = 1.366667 \text{ kWhrs}$$

Total number of units in 30 days

$$= 1.366667 \times 30 = 41 \text{ kWhrs}$$

Cost of electricity = Units \times cost per unit

$$= 41 \times 950$$

$$= 38950 \text{ paise}$$

She was not cheated

T6