

Question No 61

Part (a)

Given Data

Radius of cylinder $r = 8$ cm
Height of cylinder $h = 15$ cm
Volume = ?

Solution

$$\text{Volume of Cylinder} = \pi r^2 h$$

putting values in above formula for r , and h from given data it becomes

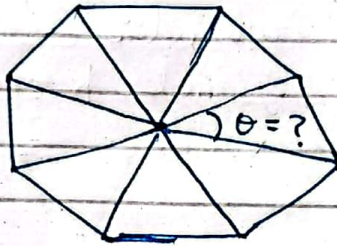
$$\begin{aligned}\text{Volume of Cylinder} &= \pi \times 8^2 \times 15 \\ \therefore \pi &= \frac{22}{7} \\ &= \frac{22}{7} \times 64 \times 15 \\ &= \frac{22 \times 960}{7} \\ &= \frac{21120}{7} \text{ cm}^3\end{aligned}$$

$$\text{Volume of Cylinder} = 3017.14 \text{ cm}^3$$

Part (B)

Given Data

Dome of rock has octagonal shape
i.e.



~~Sum~~ of total angle encompassed
by rock of dome = 360°

Total Number of sides in
rock of dome = 8

Angle of each side = ?

Solution

Let the angle of each of side = x

As total angle encompassed by rock
of dome is equally shared by
each of 8 sides so it can
be written that

$$8x = 360 \quad \text{--- (1)}$$

dividing both sides of eq (1)
by 8

$$\frac{8x}{8} = \frac{360}{8}$$

$$\boxed{x = 45^\circ}$$

Angle of each side will be 45°

Part C

Given data

Length of lake = 4.6 mile
width of lake = 2.2 mile
Surface area = ?

Solution

$$\text{Surface area} = \text{length} \times \text{width} \quad \text{--- (1)}$$

putting values of length and width from given data in eq (1)

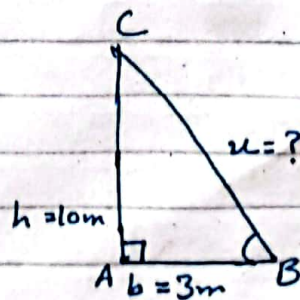
$$\text{Surface area} = 4.6 \times 2.2$$

$$\boxed{\text{Surface area} = 10.12 \text{ mile}^2}$$

Part d

Given data

height of house = $h = 10\text{m}$
distance of base
from house = $b = 3\text{m}$
length of ladder = $x = ?$



Solution

Applying Pythagoras theorem
on triangle ABC

$$x^2 = h^2 + b^2 \quad \text{--- (1)}$$

putting values of h and b from
given data in eq (1)

$$x^2 = 10^2 + 3^2$$

$$x^2 = 100 + 9 \quad \text{--- (2)}$$

taking square root on both sides
of eq (2)

$$\sqrt{x^2} = \sqrt{100 + 9}$$

$$\sqrt{x^2} = \sqrt{109}$$

$$x = \sqrt{109} \text{ m} \approx 10.21$$

Thus the ladder is ~~is~~ approximately
10.21 m

Q7

part a

Given data

~~If a~~ let the number = x

It ~~was~~ was originally supposed to be according to condition of the question = $x \times \frac{5}{3}$

After mistake it became = $x \times \frac{3}{5}$

%age error in calculation = ?

Solution

$$\% \text{age error} = 100 \times \frac{(\text{original value} - \text{error value})}{\text{original value}}$$

$$= 100 \times \frac{\left(\frac{5x}{3} - \frac{3x}{5}\right)}{\frac{5x}{3}}$$

$$= 100 \times \frac{\left(\frac{25x - 9x}{15}\right)}{\frac{5x}{3}}$$

$$= \frac{100 \times 16x}{15 \times 5x} \times \frac{3}{5}$$

$$\% \text{age error} = 64$$

So percentage error in calculation is 64%.

Q7 (b)

Given data

Ratio of chocolates to ice cream cones
= 5:8

⇒ If chocolates are $5x$, ice cream cones are $8x$

Number of chocolates = 30

Number of ice cream cones = ?

Solution

According to given conditions

$$5x = 30$$

dividing both sides of eq by 5

$$\frac{5x}{5} = \frac{30}{5}$$

$$x = 6 \quad \text{--- (1)}$$

According to given conditions number of ice cream cones are = $8x$ --- (2)

Putting value of x from eq (1), eq (2) becomes

$$\begin{aligned} \text{Number of ice cream cones} &= 8 \times 6 \\ &= 48 \end{aligned}$$

Thus total number of ice cream cones are 48.

Q7 (c)

Given data

Medication in one tablet = 30 mg — ①
total medication required = 240 mg — ②

Number of tablets required for total medication of Ms. Smith = ~~?~~ ?

Solution

Let total number of tablets required = x

They will be equal to dividing total required medication with medication in one tablet i.e. Thus ~~by putting values from eq. ① and ②~~

$$\text{total number of tablet} = \frac{\text{total medication required}}{\text{Medication in 1 tablet}} \quad \text{③}$$

putting values from eq. ① and eq. ②
in eq. ③

$$\text{total number of tablets} = \frac{240}{30}$$

$$= 8 \text{ tablets}$$

Thus Ms. Smith will need 8 tablets.

Q7 (d)

Given data

Average of 50 numbers = 20

Average after 43, 37 are discarded = ?

Solution

Average of 50 numbers = 20

by definition ~~the~~ average = $\frac{\text{Sum of all numbers}}{\text{total numbers}}$

$$\cancel{\text{the sum of all numbers}} \quad 20 = \frac{\text{Sum of all numbers}}{50}$$

Multiplying both sides of eq by 50

$$20 \times 50 = \frac{\text{Sum of all numbers}}{50} \times 50$$

$$1000 = \text{Sum of all numbers} \quad \text{--- (1)}$$

Subtracting 43, and 37 from sum of all numbers will give the sum of remaining numbers thus

$$\text{Sum of remaining numbers} = 1000 - 43 - 37$$

$$= 920 \quad \text{--- (2)}$$

$$\text{total remaining numbers} = 50 - 2$$

$$= 48 \quad \text{--- (3)}$$

Now average of remaining numbers

$$= \frac{\text{Sum of remaining numbers}}{\text{total remaining numbers}} \quad \text{--- (4)}$$

putting values from Eq (2) and Eq (3)
in Eq (4)

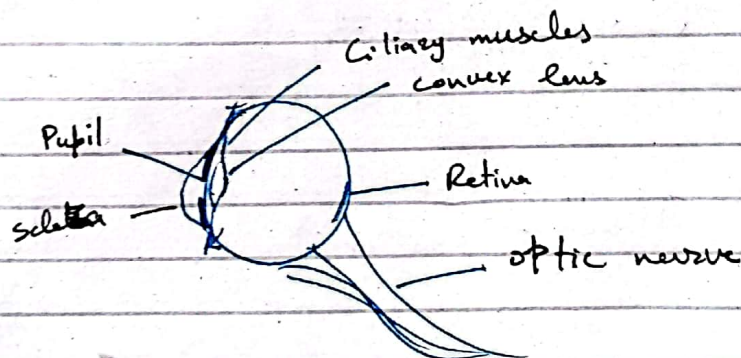
$$\text{Average of remaining numbers} = \frac{920}{48}$$

$$\approx 19.16$$

This average of remaining numbers
is ^{approximately} 19.16.

Question 4

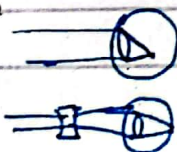
Part (a)



Myopia Correction

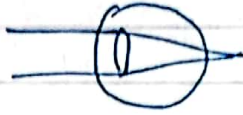
Short sightedness can be corrected
by using a concave lens to form
~~the image~~ image on retina instead of
forming it ahead of retina

correction
by concave
lens.

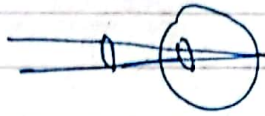


Hyperopia Correction

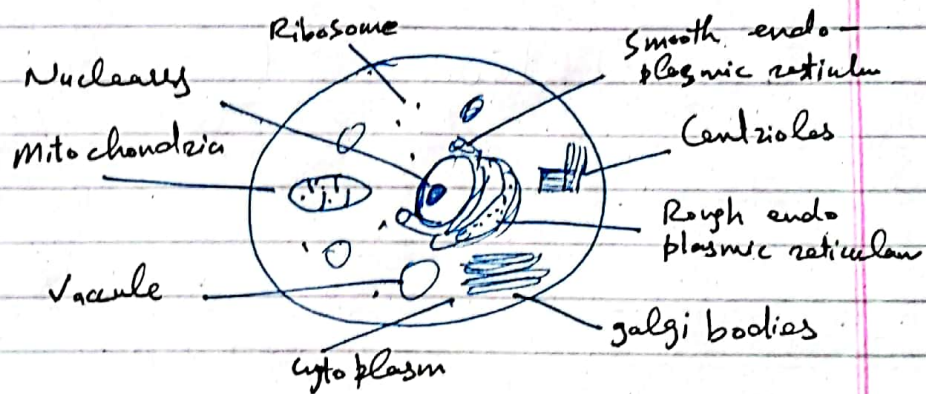
Image is formed beyond retina



An additional convex lens can correct this



Q4 Part (b)



Ribosomes: do protein synthesis

Mitochondria: site of various metabolic processes, powerhouse of the cell

Vacuole : store water and nutrients

Nucleus : store and synthesise genetic material

goly bodies: used to make various secretions, do packaging and transport them out of cell

Centrioles: play role in cell division

Question 4 (c)

Galaxies

galaxies are huge group of stars which revolve around a centre which is usually a black hole

Types of Galaxies

1. Spiral

stars are arranged in form of spiral



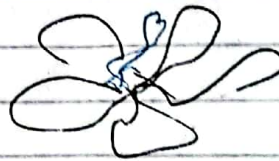
2. Elliptical

stars are arranged in elliptical shape



3. Irregular

clouds of stars are arranged in an irregular manner.



Are galaxies moving?
Yes they are moving

Evidences

1: Blue and Red Shifts

Light coming from galaxies show red shift which indicates they are moving. Same is the case with blue shift.

2. Cosmic Background Radiation (CBR)

CBR detected on x-ray sheets are also a proof of galaxies' movement.

3- Gravitational pull around black holes

Black holes a center of galaxies bend space and time due to huge gravitational pull which results in movement of galaxies.

Q4 (d)

Comparison of Earth and Sun

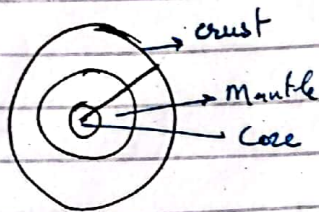
1- Atmosphere

Earth	Sun
inhabitable	uninhabitable
temperature varies with height	Extremely hot
Contain N_2 , O_2 etc	Contain Vacuum

2 - Internal Structure

Earth

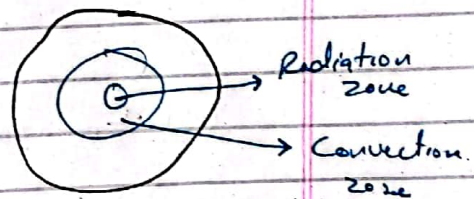
- Size of earth is extremely small compared to sun
- Contain Ni, Mg, Si, Fe
- It is solid and liquid



division of layers
on basis of chemical
composition

Sun

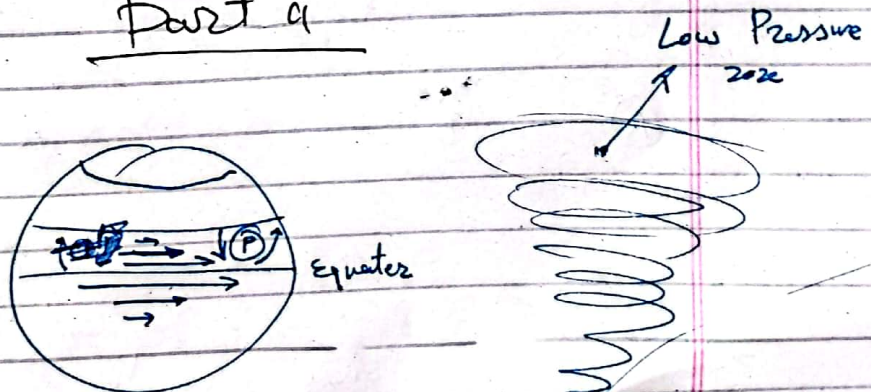
- It is huge compared to earth
- Contain H_2, He
- Its gaseous



division of layers
on basis of how
heat is transferred

Q. No 5

part a



Due to Coriolis effect air moves faster closer to equator. It is also hotter as sun light falls directly

over it. When there is a low pressure zone, cold air rushes to fill the gap produced by rising hot air near equator. The combination of Coriolis effect and low pressure zone created by rising hot air gives rise to cyclones.

Part (b)

Ionic Bond

- forms due to complete transfer of e^- s
- formed between metals and non-metals
- Very strong bonds
- Occur as solids at room temperature

Covalent Bond

- e^- s are shared b/w atoms
- formed between non-metals
- Relatively weak
- Occur as liquid or gas.

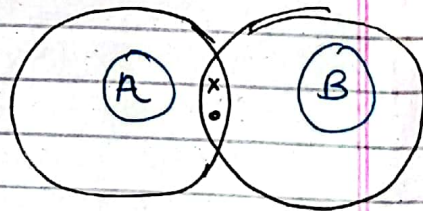
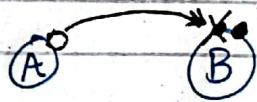


Diagram for covalent and Ionic Bond.

Q5 (c)

Radio waves

- They are used in communications in field of
 - Entertainment TV etc
 - For military communication
 - In mobile communication
 - In sonars
 - Speed guns

Gamma Rays

- They are used in
- Sterilization of equipment
 - As germicides
 - checking validity of bank notes

X-rays

- They are used in
- Detecting bone fractures
 - At security checks on airports

Q5 (d)

Tides

The high state of water in oceans due to pull from gravity of moon when it is at closer point to earth in its orbit during rotation around earth.

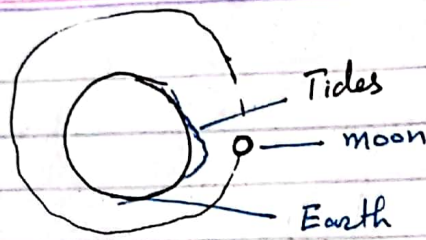


Diagram of Tides

L.E.D

leds are Light emitting diodes.

When electrons and holes combine in specially designed diodes, electrons lose their energy in form of visible light when they meet holes. This is the working principle for L.E.D.

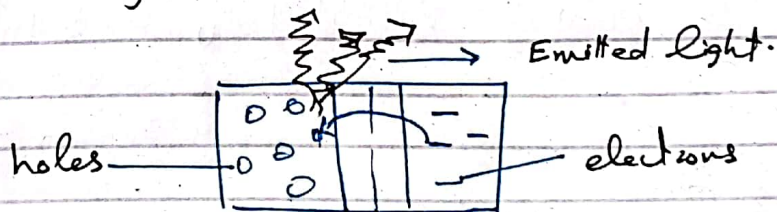


Diagram of ~~Diode~~ L.E.D