

Q.7.

(a)

Total people = 100

People who watch cricket = 65

People who watch hockey = 40

People who watch neither = 20

People watching either cricket / hockey :-

Total people - people who don't watch either

$$100 - 20 = 80$$

People who watch cricket + people who watch hockey = Total spectators

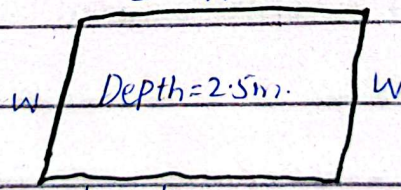
$$65 + 40 = 105$$

People watching both hockey and cricket.

$$105 - 80 = 25$$

(b)

$$L = 4 + w$$



$$L = 4 + w$$

L = length

w = width

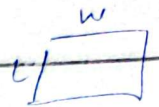
Perimeter = 72 meters.

Formula of perimeter.

$$P = 2(L + w)$$

According to given condition:

$$72m = 2(4 + w + w)$$



$$L = 4 + w$$

$$L + w = 72$$

$$L + w = 72$$

$$L + w = 72$$

$$L + w = 72$$

$$L + w = 72$$

$$\frac{3}{5} = 60$$

$$11 + b$$

$$\frac{2}{5} = 30$$

$$x = 60$$

$$x + 10 = 20$$

$$x : y = 2$$

$$4 : 5 = 7$$

$$4x = x$$

$$5x = y$$

$$7x = z$$

$$7x = 25\% (7x) = 3$$

$$5x = 17\% (5x) = 3$$

$$4x = 14\% (4x) = 3$$

$$4x + 5y + 7z = 16x$$

$$4x + (5x + 10) + 5x$$

$$7x + 10$$

$$15.75x = 16.95x$$

$$x = 16.95x$$

$$66.6 \times 15.75$$

$$315$$

$$3$$

$$11.75$$

$$+ 4$$

$$15.75x = 16.95x$$

$$x = 16.95x$$

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$$3$$

$$11.75$$

$$+ 4$$

$$15.75x = 16.95x$$

$$x = 16.95x$$

$$66.6 \times 15.75$$

$$315$$

$$3$$

$$11.75$$

$$+ 4$$

$$72m = 2(4 + 2w)$$

$$72m = 8 + 4w$$

$$72 - 8 = 4w \Rightarrow 64 = 4w$$

$$\boxed{w = 16m}$$

$$\text{Length} = L = 4 + w = 4 + 16 = 20m$$

volume of water to be filled

$$= L \times w \times d$$

$$= (20 \times 16 \times 2.5)m^3$$

$$\boxed{= (320 \times 2.5)m^3 = 800m^3}$$

(c)

city A $\xrightarrow{V_A = 60 \text{ km/h}}$
8:00 AM

$\xleftarrow{V_B = 40 \text{ km/h}}$ city B.
8:00 AM

$v = \text{speed}$ $d = \text{distance between cities} = 400 \text{ km}$

As trains are moving in opposite directions, so speed will be added.

$$v = v_A + v_B = (60 + 40) \text{ km/hr} = 100 \text{ km/hr}$$

To find $t = \text{time}$, formula will be used $v = \frac{d}{t}$

$$100 \text{ km/hr} = \frac{400 \text{ km}}{t}$$

$$100 \times t = 400 \text{ km} \Rightarrow t = \frac{400}{100}$$

$$t = 4 \text{ hr.}$$

It means trains will meet at 12:00 P.M.

(d)

Past age	Present age	Future age.
10 years ago	Father's age = x	
$x-10=4y$	Son's age = y	
$\frac{x-10}{4}=y$	Sum of ages = $x+y=75$ years.	

Present age of father = $x = ??$

$$x+y=75 \text{ years} \Rightarrow x + \frac{x-10}{4} = 75.$$

$$= \frac{4x + x - 10}{4} = 75.$$

$$= \frac{5x - 10}{4} = 75.$$

$$= 5x - 10 = 75 \times 4 \Rightarrow 5x - 10 = 300.$$

$$= 5x = 300 + 10 \Rightarrow 5x = 310.$$

$$\boxed{x = \frac{310}{5} = 62 \text{ years.}}$$

Present age of son = $y = ??$

$$62 + y = 75 \Rightarrow y = 75 - 62.$$

$$\boxed{y = 13}.$$

Q. 8.

Rea

(a)

ROAD = U Q D G.

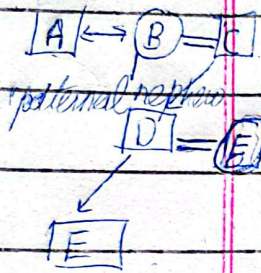
R	Q	A	D
↓	↓	↓	↓
U	Q	D	G

Now LAKE can be coded as = ?

As difference between R and U is of S and T, so L will be O. Difference between Q and A is of P, so A will be coded as C. Similarly difference between

A and D is of B and C.
 correspondingly, K will be coded as M.
 Moreover, Difference between D and G is
 of E and F, so E will be coded as
 H. Thus, LAKE can be coded as
 OCMH.

(b)



According to the given statements
 man A says to the women F
 that her husband D is the son
 of his sister B and his brother
 in law C. Moreover, E is the son of
 women F and his maternal nephew D.
 It indicates that Woman F, being wife
 of his maternal nephew D, is daughter-in-
 law of A.

(c) (i)

4×3
 12

6×3

The given series is a geometric series
 where each successive number is
 obtained by multiplying with 3. Then the
 successive number is ~~multiplied~~ ^{divided} by 2 to
 obtain next number.

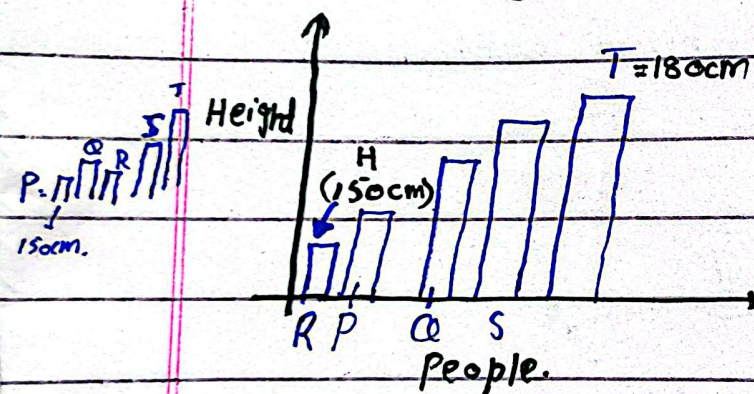
$4, 12, 6, 18, 9, 27, \dots$

By dividing 27 by 2, the next
 number will be 13.5.

(C) (ii)

In this number series, 1 is multiplied with 2 to get 2. Similarly, 2 is multiplied with 3 to obtain 6. 6 is multiplied by 4 to get 24. 24 is multiplied by 5 to get 120. Thus, 120 will be multiplied by six to get next number which is 720.

(d)



According to given statements, we will draw graph.

R has shortest height = 150cm.

R has tallest height = 180cm

So, third tallest is Q.

Range = Maximum height - minimum height -

$$= 180 - 150 = 30$$

Part - II

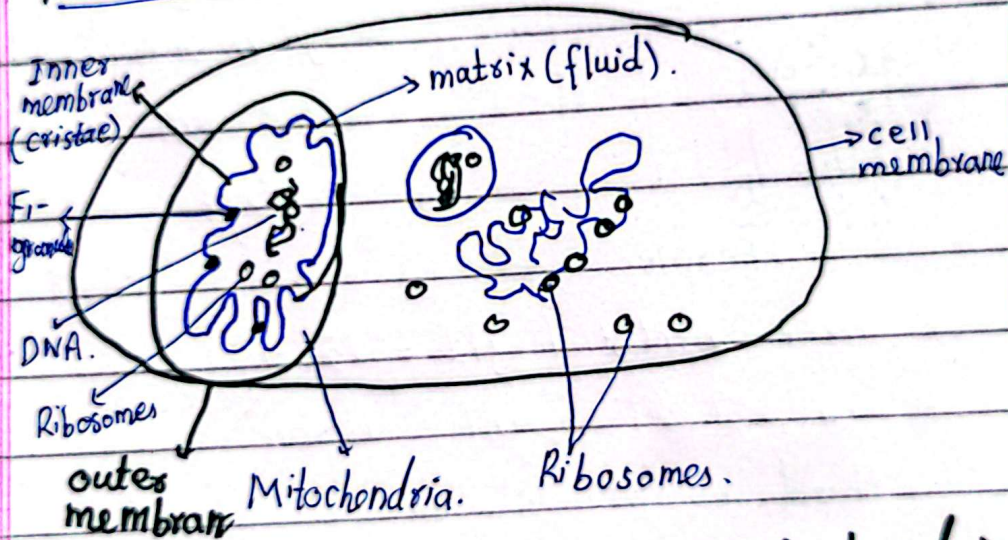
Mitochondria:

Double membranous structure inside the cell that produces energy.

Ribosomes:

Small granular structure present freely or attached to endoplasmic reticulum are called Ribosomes.

Diagram of Mitochondria and Ribosomes inside animal cell:



Structure of mitochondria:

- ① Mitochondria consists of outer membrane.
- ② Inner membrane of mitochondria is called cristae.
- ③ Fluid present inside mitochondria is called matrix.
- ④ Mitochondria has its own DNA and Ribosomes.

Function of mitochondria:

- ① Mitochondria is involved in cellular respiration.
- ② It ~~uses~~ cellular oxygen to breakdown ethanol (formed from glucose inside cytoplasm) and converts it into water, carbon dioxide and ATP (Adenosine Triphosphate)
- ③ Its F₁ granules in cristae helps in respiration.

Why called ~~curr~~ powerhouse of cell??

As mitochondria produces ATP, which acts as energy currency of the cell for reproduction and other metabolic processes. As powerhouse supply energy to country, mitochondria supply energy to the cell.

Structure of ribosomes:

- ① Ribosome consists of two subunits.
- ② Ribosome ~~to~~ subunit includes larger subunit which is 50S and smaller subunit which is 30S, which joint rto form 70S ribosome.

Function of ribosome:

- ① Ribosomes are involved in synthesis

of proteins. They take

② They take mRNA from nucleus and convert the genetic information into complex of amino acids called proteins which is known as Translation.

(b)

What are Enzymes:

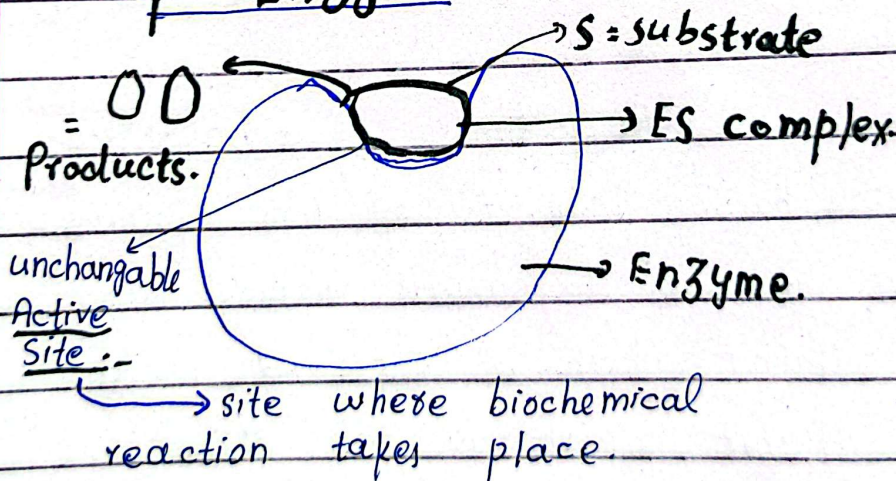
Enzymes are bio catalyst that increase the rate of biochemical reactions without changing the final products.

Composition of Enzymes:

They are made up of proteins.

Lock and key model

of Enzyme:



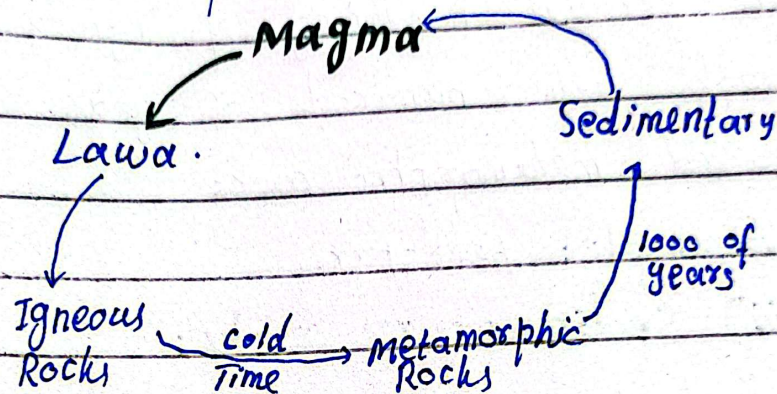
Explanation

According to lock and key Model, as one key opens a lock.

Q. 4. (a). Rock cycle:

It is the cycle of lithosphere where rocks are transitioned in the phases of igneous, metamorphic and sedimentary rocks.

Diagram of rock cycle:



Explanation:

Rocks in the mantle of earth are converted into molten form due to high temperature and pressure. That molten form called magma comes out through the vent on earth's crust called Lava. Gradually, lava cools down and converted into igneous rocks. These igneous rocks become hardened with time and become metamorphic rocks. After thousands of years, metamorphic rocks are arranged in layers called sedimentary rocks.

i) Igneous rocks:

The rocks formed directly from the freezing of lava are called igneous rocks.

Example: Lignite, peat.

ii) Metamorphic rocks:

Rocks which are formed by the gradual hardening of igneous rocks after hundreds of years are called metamorphic rocks.

Example: Feldspar.

iii) Sedimentary rocks:

Rock when metamorphic rocks are arranged in sediments, they become sedimentary rocks after thousands of years.

(b)

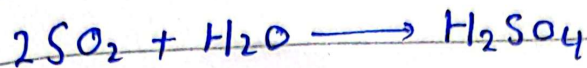
Acid Rain:

The Rain whose pH drops from normal range (5 to 6) to 4.5-5.5 due to environmental pollutants is called acid Rain.

Chemical reaction of Acid Rain formation:

pH of normal rain is dropped

due to formation of acids like Nitric acid (HNO_x) and Sulfuric acid (H_2SO_4). These are formed when nitrates and sulphates reacts with water vapours.



Harmful effects of Acid Rain on aquatic life.

- ⑥ Acid Rain drops the pH of water bodies such as rivers, lakes etc.
- ⑥ Acidic water bodies burn the aquatic life such as fishes, crabs who cannot withstand and die.

Harmful effect of acid rain on vegetation

- ⑥ Sulphuric acid in the rain destroys the vascular system of plants.
- ⑥ Nitric acid in the rain ends the capacity of chloroplast to take up sunlight.

(*)

Remote sensing and Geographical Information System.

These are the technological systems that use satellites to assess the geographical features of the earth.

Role of GIS and Remote sensing in environment monitoring.

⑥ check deforestation:

With the help of satellites, forest cover in an area can be noticed.

RADAR SAT+ can be used to check deforestation in an area.

⑥ check status of aquatic life:

Through sea-based GIS such as **SeaWiFS**, a country can detect the environment of oceans.

Role of GIS and Remote Sensing in Disaster management:

⑥ check Tornadoes and Hurricanes:

GIS and remote sensing satellites can detect changing patterns of wind in an area. In this way, it can help to keep eye on tornadoes and hurricanes.

② Give update about flood:
LANDSAT+ GIS is used to detect the activities in the mountains. Thus, it can notify about glacial melt and floods.

(d) Solid waste management:

It is the supervised collection and deposition of solid waste in the environment to avoid ecological damage.

Solid waste:

Inert waste, recyclable waste, decomposable waste, domestic waste etc.

How it is supervised:

- ① It is supervised by government institutions like Municipal authority.
- ② It includes data management of waste and collaboration of private sector.

Stages:-

Stage-I:

collection of all the waste.

Stage II:-

Accumulation of all the waste at a specific place.

Stage III:

Deposition in environmental friendly manner.

Hazards associated with improper disposal of urban waste:

⑥ Disease:

When urban waste is improperly disposed, it leads to diseases such as malaria, salmonellosis and diarrhoea etc.

⑥ water pollution:

Improper landfills in urban centres leads to absorption of waste in underground water causing water pollution.

⑥ Urban flooding:

Improper disposal of urban waste disposal leads to blockage of drainage system. The rain water accumulates in streets causing urban flooding.
