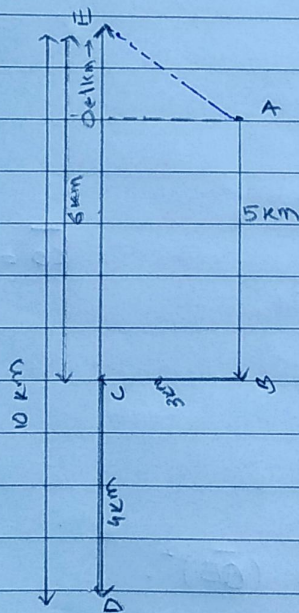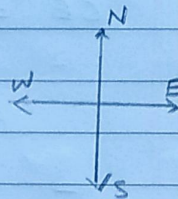## SECTION - II.

Question no: 8

8(a): A man walks 5km south ..... ?

Graphical representation of the man's journey.

A man starts from point A and after covering 5km distance turns right at point B and covers 3km distance. Upon reaching point C he turns left and covers 4 km distance. When he reaches point D he moves straight backward 10 km.

Distance of its ending point from the starting point is $\overline{AE}$.

$\overline{AE}$ can be calculated using pythagoras theorem.

$$\overline{AE}^2 = (\overline{OA})^2 + (\overline{AE})^2 \longrightarrow Ⓐ$$

From diagram.

$$\overline{CE} = \overline{DE} - \overline{CE}$$

$$= 10km - 4km.$$

$$\overline{CE} = 6km.$$

$$\overline{OE} = \overline{CE} - \overline{CO}$$

$$= 6km - 5km \qquad \overline{CO} = \overline{AB}$$

$$\overline{OE} = 1km$$

Using equation Ⓐ

$$(\overline{AE})^2 = (\overline{OA})^2 + (\overline{OE})^2.$$

$$\overline{AE}^2 = (3km)^2 + (1km)^2$$

$$\therefore OA = CB = 3km$$

$$\overline{AB}^2 = (9 + 1)km^2.$$

$$AE = \sqrt{10}km \qquad \begin{array}{l} 2 \times 3^2 \\ 3\sqrt{2} \end{array}$$

$$AE = 3\sqrt{2}\ km.$$

The man is now in northwest direction from it's orignal / starting position.

8(b): Find arithmetic mean of cubes of 1st five prime numbers.

First five prime numbers are 2, 3, 5, 7, 11.

Taking their cubes.

$$2^3 = 2 \times 2 \times 2 = 8.$$

$$3^3 = 3 \times 3 \times 3 = 27$$

$$5^3 = 5 \times 5 \times 5 = 125$$

$$7^3 = 7 \times 7 \times 7 = 343$$

$$11^3 = 11 \times 11 \times 11 = 1331.$$

$$\text{Mean} = \frac{\text{Sum of all the numbers / observations}}{\text{total no. of observations.}}$$

$$= \frac{8 + 27 + 125 + 343 + 1331}{5}$$

$$= 1834 / 5.$$

$$\boxed{\text{mean} = 366.8}$$

8(c): A group of 50 men . . . . . ?

No. of men	No. of days
↑ 50	· 40 ↑
↓ 70	x

$$\frac{50}{70} = \frac{x}{40}$$

$$x = \frac{5}{7} \times 40$$

$$= \frac{200}{7}$$

$$\boxed{x = 28.5 \text{ days}}$$

70 men will take 28.5 days to construct 20 km road.

8(d): Zahid left a property . . . . . ?

Worth of property = Rs 1750,000/-
Debt = Rs 150,000/-

Money to be distributed = Total - Debt.

$$= Rs\ 1750,000 - Rs\ 1:50,000$$

Amount to be distributed $= Rs\ 1600,000/-$

Ratio of Share.

Daughter : Son

1 : 2

Daughter's share $= \dfrac{1}{3} \times \overset{533\,3\,33.3}{(1600,000)}$

Daughter's Share $= Rs\ 533,333.3/-$

Son's share $= \dfrac{2}{3} \times (1600,000)$

$$= \dfrac{3200,000}{3}$$

Son's Share $= Rs\ 1066666/-$

Question no: 6

6(a): Indentify the series.

(i)   10, 100, 200, 310, _____

series is increasing by adding 90
than 100 and then 110.
so the next number is obtained by
adding 120.

so, $310 + 120 = 430$.

(ii)   3, 7, 23, 95, _____

6(c): Nisha is 15 years elder to
. . . . . . ?

Let,

Present age of Nisha = x.

Present age of Romi = y.

Given.

$$\boxed{x = 15 + y} \quad \Rightarrow \quad \boxed{x - y = 15} \longrightarrow (i)$$

A

Also,

$$x - 5 = 3(y - 5).$$

$$x - 5 = 3y - 15.$$

$$x - 3y = -15 + 5.$$

$$\boxed{x - 3y = -10} \longrightarrow (ii)$$

Subtracting (ii) from (i).

$$x - y = 15$$
$$\underline{\mp x \pm 3y = \pm 10}$$

$$2y = 25.$$

$$y = \frac{\overset{12.5}{\cancel{25}}}{2}$$

$$y = 12.5 \text{ years.}$$

Put in (A).

$x = 15 + 12.5$

$$\boxed{x = 27.5 \text{ years}}$$ Nisha's present age.

6(d): 210 oranges, 252 apples . . . . . . ?

Taking H.C.F.

2	210 , 252 , 294
3	105 , 126 , 147
7	35 , 42 , 49
	5 , 6 , 7

H.C.F = product of common factors.

$= 3 \times 3 \times 7$

$= 63$

63 cartons are needed.

6(b): The perimeter of a rectangle . . . . ?

The perimeter of rectangle = ~~2x+2y~~

$2(L + W)$.

two opposite sides of a rectangle
are equal so,

$3x - y = 2x + y$

$$3x - 2x = y + y$$

$$\boxed{x = 2y}$$

Perimeter $= 2(L + w) = 114\,cm.$

$$= 2\left[(2x-3) + (2x+y)\right] = 114\,cm$$

$$= 2\left(2x - 3 + 2x + y\right) = 114\,cm$$

$$= 2\left(4x - 3 + y\right) = 114.$$

$$8x - 6 + 2y = 114$$

$$8x + 2y = 114 + 6$$

$$8x + x = 120$$

$$9x = 120$$

$$\boxed{x = 13.3\,cm}$$

$$y = \frac{x}{2} = \frac{13.3}{2} =$$

$$\boxed{y = 6.6\,cm}$$

Area of rectangle $= (2x - 3)(2x + y)$

$$= \left[2(13.3) - 3\right]\left[2(13.3) + 6.6\right]$$

$$= \boxed{23.6}\,\boxed{32.6}$$

$$\boxed{Area = 769.36\,cm^2}$$

SECTION -1

Question no: 4

(a)

Causes of land pollution:

There are several factors that contribute to land pollution. Following are some of them.

1) Air pollution:-

Air pollution in the form of acid rain, acidifies the soil and make it polluted. Plants get deprived of the nutrients and eventually die. It impact the fertility of soil.

2) Solid waste:

Another factor that causes land pollution is solid waste that is not disposed off sustainably - Open dumping is the biggest contributor of land pollution. Solid waste needs to be treated and disposed off properly.

3) Use of Chemicals:-

Use of chemicals in the form of fertilizers and pesticides can harm the soil and over the period

of time makes it unfit for agriculture.
Along with that chemicals from the
other sources like industries and household
also cause land pollution.

4. Over-population:

Increase in population means increase
in demand of food and other commodities.
This results in the generation of more
waste and without its proper disposal
it will contribute to the land pollution.

5. Deforestation:

Forest are cut due to many reasons
that include industry, medicine, furniture
urbanization etc. Forests purify the
air that lowers the ~~change~~ chances of
acid rain or any other activity that
might lead to land pollution.

6. Unsupervised Industries:

Over the years, the number of
industries are increasing day by
day. These industries release a great
amount of waste material that are is
mostly toxic into the environment.
This is a cause of land pollution.

4(c):

Role of GIS in environmental Science:

1) GIS is used to monitor the environment.

2) It is used in environmental science to detect macropatterns that include mountains, rivers, deserts etc.

3) It is used to estimate the change in environment of over the years.

4) In the time of disaster, GIS can be used to predict the possible outcome.

5) It can be used to give early warning about the disaster.

6) It can tell about the level of pollution in the certain area.

7) Environmentalists use GIS to study different types of rocks.

4(b):

Goals of COP-27 :-

1) Main goal of the COP-27 was to aware the world of the devastating situation of the environment due to climate change.

2) It talked about the Climate justice. Those countries that emit less than their ascribed carbon quota but are the most affected by the climate change.

3) Provision of funds to the deserving countries that suffered due to the devastating floods triggered by the climate change.

4) Shift from the fossil fuel to the clean energy was encouraged.
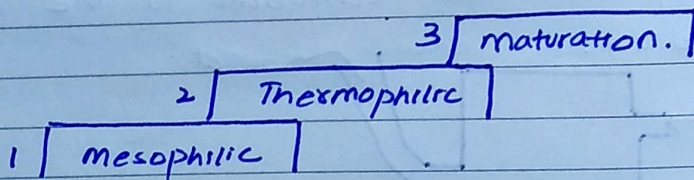
Question no: 2

2(b):

Composting, incineration, and pyrolysis are the different methods of solid waste management. These methods are performed during the recovery stage of solid waste management.

a) Composting:
" Composting is the gradual biological decomposition of the organic waste. "

It usually compose of three phases.
1) Mesophylic phase
2) Thermophilic phase
3) Maturation phase.

```
                          3 | maturation. |
              2 | Thermophilic |
     1 | mesophilic |
```

Mesophylic phase is the first step. In this simple waste decomposes using mesophilic bacteria. The Temperature is usually upto 40°C.

Second phase is Thermophilic phase, in this temperature is kept upto above 40°C. In this step, thermophilic bacteria is used to decompose complex waste.

In the last, maturation phase, Temperature
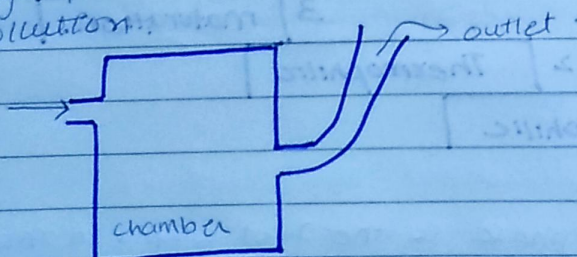
is dropped to 0°C and a compost is formed.

: (d) - c

b) Incineration:

" The burning of solid waste, other than organic waste is called Incineration process. "

In this process incinerators are used. Incinerators are the chambers in which the process of incineration takes place at very high temperature usually upto 200°C.

Incineration is carried out in closed and contained facilities but it is harmful for the environment as it releases toxic by products that contribute to the pollution.

(Incinerator).

2(d):

Semiconductor is a material having electrical properties between conductor and an insulator.

Doping is the addition of impurity to a semiconductor. Doping increases the conductivity of the semiconductor by increasing the concentration of electron and hole pair in semiconductor.

Based on the doping there are two Types of semi conductor.

1) P-type semiconductor
2) N-type semiconductor.

(a) P-type semiconductor:

1) P-type semiconductor, a type of an extrinsic semiconductor, is formed by the addition of trivalent impurity.

2) Elements from 3-period having 3 valence electrons are added

3) In this type of doping there are more no of holes in semiconductor than no. of electrons. ($n_h \gg n_e$)

(b) N-Type Semiconductor:

A.

1) A subtype of extrinsic semiconductor, is called N-type semiconductor if

Pentavalene impuvity is added to (i.e.

2. Elementi from 5th pailod having 5 valence electron make semiconductoo -n-Type

3. In n-type Semiconductore, no. of electrons are greater than the number of holes.
$(n_e >> n_h)$.