Date 15-June-23

Very good
Perfect paper presentation
Enough length
Enough headings
Good for math work
Keep it up.

SECTION-A

Q.No: 5

(a)

Use of any Five electromagnetic Radiations:-

1. Radio waves:-

i) Radio waves are used in television and FM broad casts.

ii) Radio waves are used in mobile phones

iii) Radio waves are also used in wireless computer networks.

iv) They are used in various other communication applications.

v) They are also used in space communication.

2. Microwave:-

i) They are used are heating application.

ii) Microwave are also used for communication

iii) Microwaves are also used for cooking

iv) Micro waves are used is radar

and remote sensing
v) They are used for satellite communication.

3. Visible light:-

1. Visible light is used for human vision
2. Visible light is used in fibre optic communication
3. Visible light is used in photography
4. It is also used in electronic devices
5. They are also used as laser light.

4. Ultra violet:-

i) UV is used for industrial process
ii) Ultra violet radiations are used in medical and dental practices
iii) Ultra violet rays are used in killing bacteria and viruses.
iv) Ultra violet rays are used for Sterilization process
v) UV radiations are used for odor control.

5. X-rays :-

i) X-rays are used to detect bone fractures

ii) X-rays are used to perform dental check up.

iii) X-rays are used to diagnose Cancer.

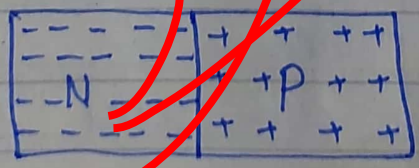
iv) X-rays are used to diagnose injuries

v) To diagnose symptoms of disease in the body.

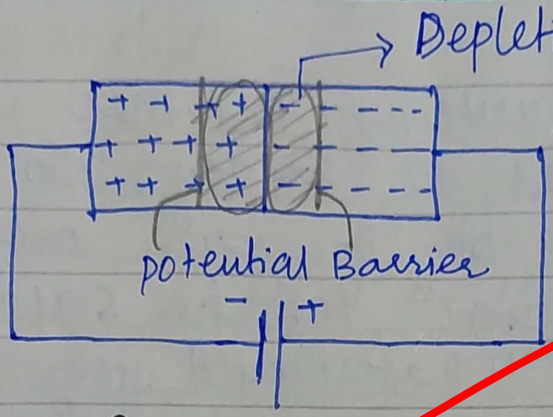
(b) Explain LED

What is LED?

LED is light emitting diode, are energy efficient and rapidly developing lighting technologies. LED lights last longer, are more durable and offer better light-quality.



Diode



Depletion Region:- Depletion Region is a chargeless region found in P-N junction.

Biasing:- Biasing in LED is to provide it external current/voltage. There are two types of biasing
i) Forward biasing
ii) Reverse biasing

Forward biasing:-
Biasing in which N type is connected to Negative terminal and P type is connected to positive terminal is called forward biasing

Reverse biasing:
Biasing in which N type is connected to positive terminal and P type is connected to negative terminal is reverse biasing.

Advantages of LED:-

i) They have long life time.
ii) They are not effected by cold temperature
iii) LED lights instantly - in nanoseconds.
iv) LED are energy efficient
v) LED are environment friendly. Do not contain mercury or another hazardous materials.

c) Semi-conductors & Ceramics:-

Ceramics:-

Ceramic are inorganic, non-metallic solid made up of clay. They are shaped and hardened by heating at high temperature. Ceramic are all around us. Glass in your home, tile, bricks, toilets you are using all are made up of ceramics.

General properties:-

1) They are brittle, having little elasticity
2) Ceramic are oxidation-resistance

3) They are corrosion resistance.
4) Ceramic are refactory material with high melting point.
5) They are inert to chemical action and donot react with most liquids, gases, alkali, acid. etc.

How ceramics are formed?

long time ago ceramic was formed with the simple process, no machine was involved. the steps include digging of the clay, mixing it with water to form a ~~mold~~ dough, giving it shape by keeping it in a mould or by rotating wheel and then firing in a kiln. Now a days modern methods are being used in which machine is used to make dough and it presses out like a toothpast, another step is jiggering and final step is hot pressing.

Applications:-

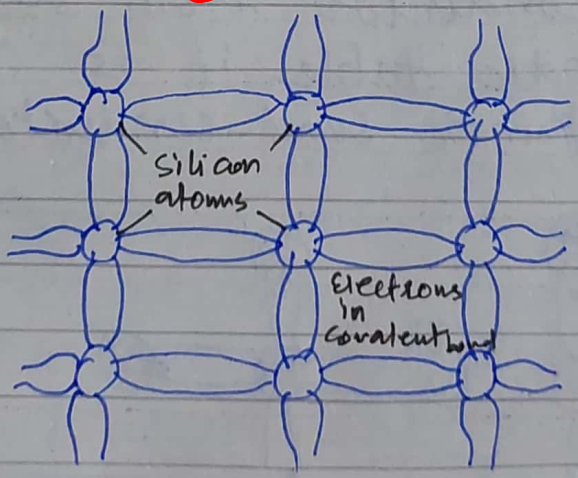
ceramics are used in space shuttle, glassware, pottery, dinnerware, for filling in

dental treatment, for manufacturing of naval and military equipments. They are also used as abrasives and for coating purposes.

Semiconductor:-

Semi Conductor are the materials that conduct electricity, not fully, but partially. They are extensively used in electronic circuits. Most Semi conductor are crystal made up of certain materials.

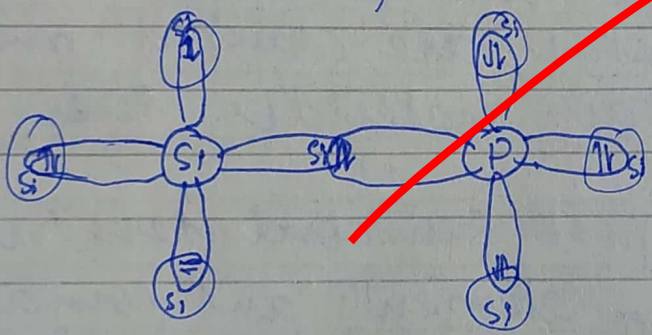
Example:- Most semiconductors include the following elements and compounds silicon, germanium, gallium, zinc etc.



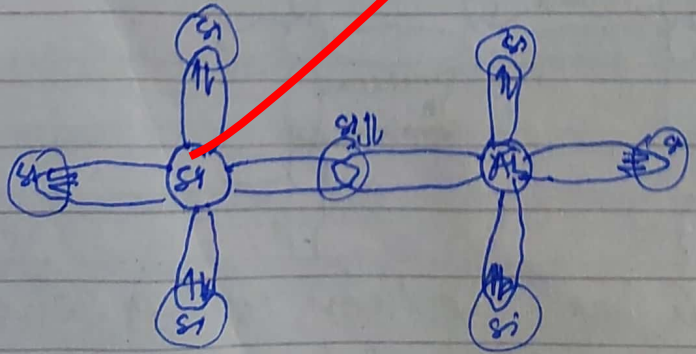
Arrangments of electron in a Semi conductor materials.

There are two types of Semiconductor
1) N-type extrinsive Semiconductor
2) P-type Extrinsive Semiconductor

N-type extrinsic Semiconductor:-
When impurity is added to pure Semi conductor from 5th group of the periodic table, N type extrinsic Semi-conductor is formed.



P-type extrinsic Semiconductor:-
When impurity is added to a pure Semi-conductor from 3rd group of the periodic table, it is called P-type extrinsic semi-conductor.



Q5(d) Note on Polio

Introduction:-

Polio is a highly infectious viral disease which highly affects the children. Polio cases have decreased by over 99% since 1988 from 35,000 cases to 74 reported in 2015. Unlike most disease polio can be eridicated completely. Polio virus do not survive outside the human body. If the virus do not get body to of unvaccinated person to infact it will die out.

Symptoms:-

The early sign and Symptons of the virus include fever, vomiting, fatigue, headache, stiffness in the back and pain in the limbs. It causes irreversible paralysis (usually in the legs) in human body.

Development and Prevention:-

The poliovirus spread through human faeces. People become infected with polio by eating contaminated food and water. virus enter in human mouth through food and then move to intestine from where it is multiplied. and pass from feces of infected person.

Prevention:-

There is no cure for polio, it can only be prevented. The infected person should wash his/her hands properly before touching anything. Adults can be infected by changing the diapers of infected infants.

Vaccine:-

There are two types of vaccine for polio virus

i) inacted polio virus (IPV)
ii) oral polio virus (OPV)

Inacted polio virus:-

Inacted polio virus (IPV) are injected in human arm. They are given through injections. Given at the early years of life

Oral polio virus:-

Oral polio virus (OPV) are given as drops. They are also given to children at the early ages of their lives.

vaccine has 04 doses
dose 1 from birth to 02 months
dose 2 from 04 to 06 months
dose 3 from 12 to 18 months
dose 4 from 3 to 4 years.

Q4 (a)

Comparision of goals of COP 26 and COP 27:-

COP 26	COP 27
To control wildfire:- At glasgow in 2021, challenge set for the world was to control wild fire.	**To control wildfire:-** The set target to control wildfire is also set at COP 27.
To Save forest:- Another target set at COP 26 was to save forest to make environment Green and sustainable.	**To save forest:-** The same target of saving the forests of the world is for COP 27.
To plant more trees:- Planting of trees was the goal of previous COP's too	**To plant more trees:-** Same target was set for COP 27

Net zero and 1.5 degrees:-

countries are called to meet neb zero carbon emission by 2050. and to keep temp. below 1.5°C

Collaboration:-

collaboration was to finalise the paris rule book to set out the rules for paris agreement.

$ mobilise finance:-

under this goal developed nations were asked to mobilise $100 bn in climate finance per year for poorer nations to tackle climate change.

temperature decrease 1.5°:-

countries pledged and plan real actions to limit global warming

Net zero by 2050:-

It says that urgent action is need to reduce emission by 2030 and to reach net zero by 2050.

Loss and damage funds:-

It's the same concept of mobilise finance. But the amount to be given is not finalised. It would be finalised at next cop. fund would be given to countries afflicting with climate change.

(b)

Methods of Solid Waste Management:-

Solid waste management refers to the systematic management of the generation, collection, transfer, treatment, recycling and disposal of solid waste. Following are the methods to control solid waste management.

1. Land fill:-

In this method the solid waste that is not reusable or can not be recycled is spread as a thin layer in low-land area and then a thin layer of soil is added upon the waste. The land used for land fill can not be further used for construction but for parks and play grounds.

2. Waste compaction:-

In this method the solid waste which can be compacted like cans, bottles, disposable cups etc are sent for compaction then they are recycled.

3. Composting:-

All the food waste, food scraps, yard wastes etc are being buried under the layer of the soil, they are left to decay which can result in formation of nutrient rich manure.

4. Biogas Generation:-

Biodegradable material and waste like: food item, animal waste or organic industrial waste from food packaging industries are sent to bio-degration plant where they are converted into biogas by degradation with the help of bacteria, fungi and microbes.

(c) Causes of water pollution:-

Water pollution is the contamination of water with harmful substances, that may be solid or liquid which are harmful for the life of living organisms. Following are the causes of water pollution.

1. Sewage system and untreated waste water:-
Sewage water which contain impurities, full of dirt, human feces, urine, and all the used domestic water are directly sent to the rivers which treating them to remove impurities. It is haemful for the life of all living organism.

2. Waste from industries:-
waste from the industries which may include oil and other chemicals are disposed

into the rivers. It pollutes the water and is a serious harm for the life of aquatic plants and animals.

3. Dumping:-

Dumping of the solid waste into the water is another reason of water pollution. It causes blockage in the flow of water and make it contaminated

4. Aquatic Plant:-

There are some aquatic plants which are cause of water pollution. They grow in fresh water and absorb all the essential nutrients from plants making it unfit to use for other organisms

5. Acid Rain:-

Acid rain contain harmful chemicals like Nitrous oxides and sulphuric acid. and the precipitation through acid rain makes water polluted.

SECTION-B

Q6(a)

Data:-

→ value of machine depreciates at the rate of 10% every year

→ present Price = 8748 Rs.

Find:- Price 3 years ago

Solution:-

Present value = 8748

Time = (t) = 3 years

original value = P = ?

Rate = 10%

Formula :-

$$\text{Present value} = P\left(1 - \frac{R}{100}\right)^T$$

$$8748 = P\left(1 - \frac{10}{100}\right)^3$$

$$8748 = P\left(\frac{100 - 10}{100}\right)^3$$

$$8748 = P\left(\frac{90}{100}\right)^3$$

$$8748 = P\left(\frac{729}{1000}\right)$$

$$\frac{8748 \times 1000}{729} = P$$

$$P = 1200$$

Price of machine 3 years ago was 1200 Rs.

Q6 (b)

Data:-

Present age		Age After 05 years	
Father	daughter	Father	daughter
$4x$	x	$4x+5$	$3(x+5)$

Find:- After futher 5 years how many times father would be of his daughter's age?

Solution:-

$$4x+5 = 3(x+5)$$
$$4x+5 = 3x+15$$
$$4x-3x = 15-5$$
$$\boxed{x = 10}$$

Present Age of daughter = 10 years

Present Age of Father = $4x = 4\times10 = 40$ years

After 10 years their ages will be

Daughter = $10+10 = 20$ years

Father = $40+10 = 50$ years

So, After 10 years Father will be 2.5 times of his daughter's age.

(c) Data:-

volume of football ?

diameter = 12cm

Solution:-

Formula:- $\text{volume} = \frac{4}{3}\pi r^3$

$\therefore d = 12\text{cm}$

$r = 6\text{cm}$

$\text{volume} = \frac{4}{3}(3.141)(6)^3$

$\text{volume} = 1.333 \times 3.141 \times 216$

$\text{volume} = 4.1896 \times 216$

$\boxed{\text{volume} = 904.381\ \text{cm}^3}$

Hence, the volume of football with 12cm diameter is $904.381\ \text{cm}^3$

Ans

1.333
3 | 4
-3
10
-9
10
-9
10
-9
1

3
36
×6
216

1.333
× 3.141
1 333
1 5332 X
1 1333 X X
3999 X X X
4.186953

(d) data:-

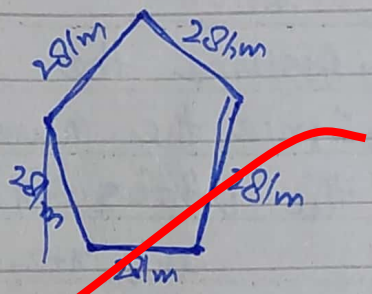
Shape = Pentagon

each side = 281 m

perimeter = ?

solution:-

Perimeter = a+b+c+d+e



Perimeter = 281 + 281 + 281 + 281 + 281

Perimeter = 1405m

Hence, the perimeter of building with regular pentagon is 1405m.

Q7 (a)

Data:-

Average of 7 consecutive number = 20

Find the largest number

Solution:-

→ Assume the smallest number is x

→ Since the numbers are consecutive the other numbers would be

$x+1,\ x+2,\ x+3,\ x+4,\ x+5,\ x+6.$

Formula:-

$$\text{Average} = \frac{\text{Sum}}{\text{Total \# of observation}}$$

$$20 = \frac{x + x+1 + x+2 + x+3 + x+4 + x+5 + x+6}{7}$$

$$20 = \frac{7x + 21}{7}$$

$$20 \times 7 = 7x + 21$$

$$140 = 7x + 21$$

$$140 - 21 = 7x$$

$$119 = 7x$$

$$x = \frac{119}{7}$$

$$\boxed{x = 17}$$

Smallest number is 17.

2nd # = 17+1 = 18
3rd # = 18+1 = 19
4th # = 19+1 = 20
5th # = 20+1 = 21
6th # = 21+1 = 22
7th # = 22+1 = 23

So, the largest number is 23

(b) Data:-
A told B that C is Nephew of his father.
D cousin of A, but not brother of C.
Relation b/w D and C ?

Solution:-
Since C is the nephew of A's father means, C is A's cousin

D is also cousin of A, but not brother of C

So, the relation between D and C is of Cousins.

(c) Find the next number in sequence

7, 12, 19, 28, 39, 52
+5 +7 +9 +11 +13

7+5 = 12
12+7 = 19
19+9 = 28
28+11 = 39
39+13 = 52

3

(d) Data:-
Sum of money to be distributed b/w A, B, C, D
Ratio = 5:2:4:3
C get Rs 1000 more than D
Find share of B.

4

Solution:-
let 5x, 2x, 4x, 3x be the shares of A, B, C, D respectively.

Since, C get 1000 more than D
4x = 3x + 1000
4x - 3x = 1000
x = 1000

So, the share of B is 2x

$= 2 \times 1000$

$= 2000$ Rs

Share of B = 2000 Rs