

LMS ID = 34049

Batch # 64

July Mock GSA Paper

PART - I

- ① Malaria (A)
- ② 7 (C)
- ③ Rontgen (A)
- ④ Elliptical (A)
- ⑤ Kidneys (D)
- ⑥ Mars (C)
- ⑦ Mars (A)
- ⑧ 10-20 (A)
- ⑨ Loss of Electron (B)
- ⑩ 30-40 (B)
- ⑪ 10^9 meter (C)
- ⑫ Concave Lense (B)
- ⑬ $1g/cm^3$ (A)
- ⑭ Salt (A)
- ⑮ Mercury (D)
- ⑯ Electron (A)
- ⑰ Oceans (A)
- ⑱ Igneous (A)
- ⑲ Silicon (D)
- ⑳ Amylase (D)

PART - II

SECTION - I

QUESTION NO 3

(a)

Atoms form chemical bonds to achieve greater stability. This ability is often achieved by fulfilling the octet rule. The octet rule states that atoms are most stable when they have 8 electrons in their valence shell. To achieve a full valence shell, atoms share, gain or lose electrons resembling the electronic configuration of noble gases.

Covalent Bond in Water Molecule

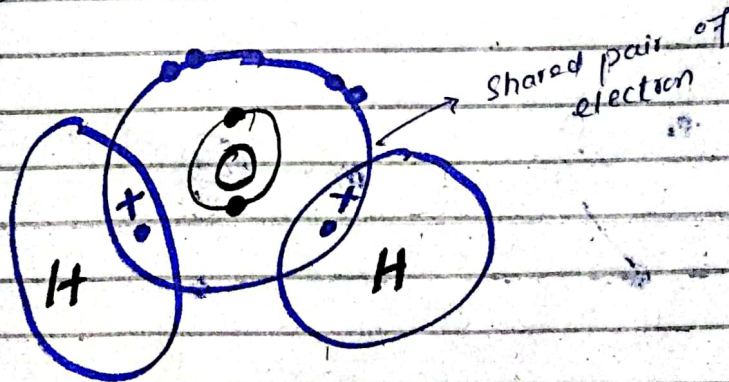
Covalent bond is a type of bond in which atoms share their valence electrons to complete their octet and achieve stability. In water molecules (H_2O), covalent bonds are formed between the oxygen atoms and two hydrogen atoms. Oxygen has 6 electrons in its outer shell and needs 2 more to complete its octet. Each

hydrogen atom has 1 electron and needs 1 more to achieve the stable configuration of helium, which is two electrons.

Formation of Covalent Bonds

Oxygen shares one of its electrons with each hydrogen atom. This sharing allows both hydrogen atoms to achieve a stable electron configuration with two electrons in their outer shell.

The shared electrons form pairs, creating a covalent bond between the oxygen atom and each hydrogen atom. In a water molecule there are two such covalent bonds.

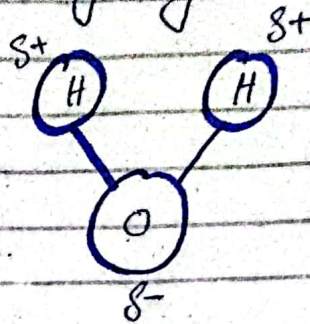


Covalent bonds in H₂O molecule

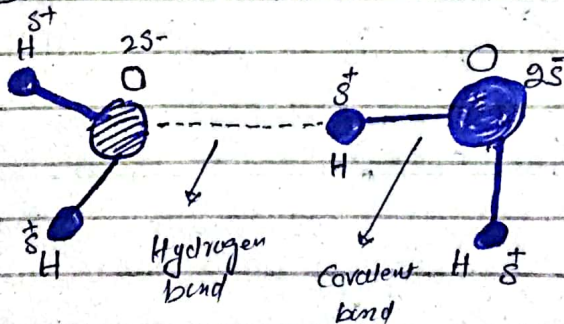
Properties of Covalent Bonds in Water

→ The covalent bonds in water are polar. Oxygen is more electronegative than hydrogen, meaning it attracts the shared pair more strongly. The result is

partial negative charge near oxygen and the partial positive charge near the hydrogen atoms.



→ The polarity of water molecules leads to hydrogen bonding between the hydrogen of one water molecule and the oxygen of another. This is responsible for many of water's unique properties, such as its high boiling point, surface tension, and solvent abilities.



(b)

Doping:

Doping is intentional introduction of impurities into an intrinsic semiconductor to change its electrical properties.

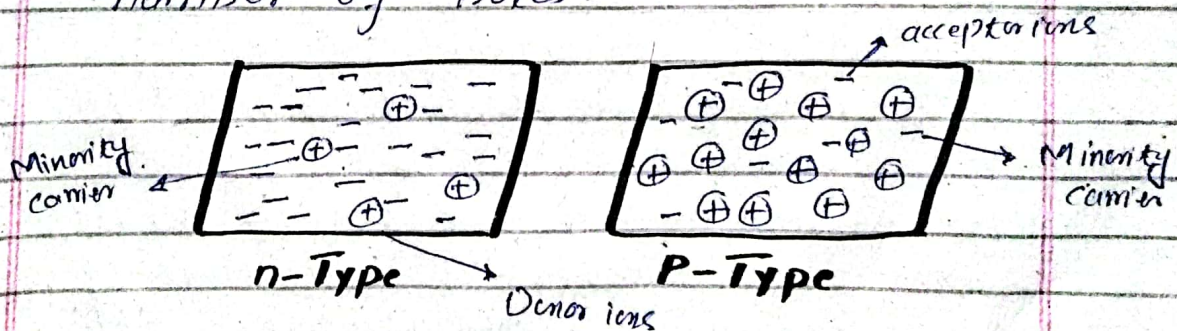
This process is critical in the creation of various semiconductor devices, such as diodes, transistors, and integrated circuits.

Types of Doping:

There are two types of doping: n-Type Doping and p-Type Doping.

In n-Type doping pentavalent elements such as Phosphorus are added to the semiconductor. The atoms of these elements add extra electrons to the semiconductor increasing its negative charge carriers.

In p-Type doping trivalent elements such as boron are added to the semiconductor. The holes (positive charge carrier) in these atoms accept electrons from the semiconductor increasing the number of holes.



Effect of Doping:

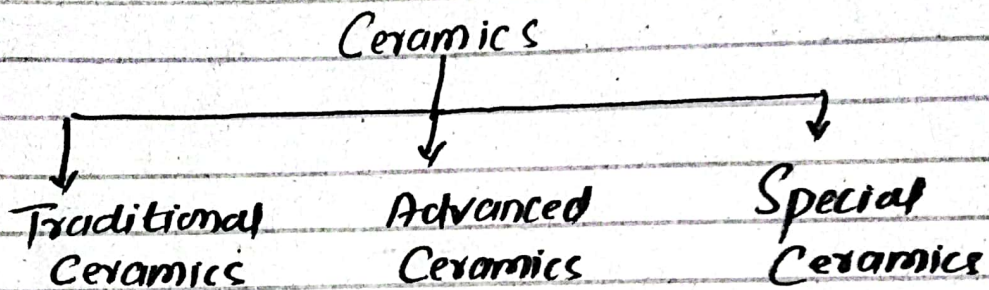
Doping increases the conductivity of the semiconductor by increasing the number of charge carriers (electrons or holes).

Ceramics:

Ceramics are broad class of materials known for their hardness, brittleness, heat resistance, and electrical insulation properties.

Types of Ceramics:

There are main 3 classes of Ceramics.



① Traditional Ceramics:

① Clay products: It includes pottery, bricks and tiles. Pottery includes earthenware, stoneware and porcelain. Bricks and tiles are fundamental in construction.

② Refractories: Refractories are ceramics that are capable of withstanding extremely high temperature without melting or degrading. Common refractory materials include silica, magnesia and zirconia. They are used in industries such as steelmaking and glass production.

① Cement and Concrete :

Portland cement is the most common type of cement used globally. It acts as a binding agent in concrete. Concrete is a composite material that is essential in construction for building infrastructure.

② Advanced Ceramics :

(A) Oxide Ceramics: Alumina (Al_2O_3) is one of the most widely used oxide ceramics. It is known for hardness, thermal stability and resistance. Similarly Zirconia (ZrO_2) is another oxide ceramic.

(B) Non-Oxide Ceramics: It includes carbides and nitrides. Silicon carbide is used in abrasives and cutting tools. Silicon nitride is used in engine components.

(C) Composite Ceramics: Cermets and fiberglass are the examples of cermets. They are used in cutting tools and automotive parts.

③ Special Ceramics :

It includes piezoelectric ceramics, magnetic ceramics and bio ceramics. These are used as sensors, for data storage, and for promoting bone growth.

(C) Global Warming: It is the long-term rise in Earth's average temperature due to human activities, particularly the emission of greenhouse gases.

Merits of Global Warming:

- Some regions, especially in the higher altitudes, may experience longer growing ~~seasons~~ seasons.
- Warmer winters may reduce the need for heating in colder regions, leading to lower energy consumption and cost.
- Melting ice in Arctic opens up new shipping routes.
- It may also increase tourism.

Demerits of Global Warming:

- ① More frequent and severe heatwaves, hurricanes, droughts, and heavy rainfall.
- ② Rising sea levels due to melting ice caps and glaciers.
- ③ Loss of biodiversity due to changing temperature and shifting weather patterns.

(C) Water scarcity

(E) Human health risk due to changing temperature.

(D)

Polio:

It is a highly infectious viral disease caused by poliovirus. It primarily affects children under the age of five and can lead to permanent paralysis or even death. This virus is transmitted through contaminated water and food or through direct contact with an infected person.

Challenges in Eradicating Polio

From Pakistan:

- Polio teams have faced attacks and violence from militant groups.
- Reach to conflict zones is a major issue for the vaccination teams.
- There is very misinformation about polio vaccines. Some people believe that it causes sterility so they avoid vaccination.
- Use of vaccination campaigns for

intelligence activities has also affected the trust of people.

→ Many areas in Pakistan are difficult to access.

→ In some areas cultural norms restrict female health workers from vaccination.

→ Some religious scholars also oppose vaccination, that affect public consent.

Question no 4

(a)

Liver Juice "Bile":

Bile is vitreous digestive fluid produced by the liver and stored in gallbladder. It play a crucial role in the digestion and absorption of fats and fat-soluble vitamins in the small intestine.

Composition of Bile:

Bile is composed of several components:

Bilirubin:

This is yellow pigment form from the breakdown of hemoglobin in the red blood cells. It gives bile its characteristic color.

Bile salts:

They emulsify fats breaking them down into smaller droplets to increase the surface area.

Cholesterol:

Excess cholesterol from the body is excreted through bile.

Functions of Bile:

- Fat emulsification.
- Absorption of fat-soluble vitamins.
- Excretion of waste products.
- Neutralization of stomach acid.
- Production and storage function.

(b)

Kidneys:

Kidney are bean-shaped structure. They are two in number. They are vital for maintaining bodily balance by filtering blood to remove waste products and regulating fluid and electrolyte level.

Role of Kidney in Excretion.

Blood enters the kidney via renal arteries and undergoes filtration in nephrons where water, electrolytes and waste are filtered. Essential substances like glucose and amino acids are reabsorbed into bloodstream, while excess ions and drugs are actively secreted into the renal tubules. The remaining fluid becomes urine, which passes through collecting ducts to the renal pelvis and finally come out of the body through urethra.

② Solid Waste Management:

Effective solid waste management is crucial for environmental sustainability.

Several methods are employed globally to manage solid waste, each with its own benefits and challenges. Firstly, waste reduction focuses on minimizing waste generation through efficient product design and consumption patterns. Recycling and composting involve reusing material like paper, plastic and organic matter to reduce landfill volume and conserve resources.

Landfilling remains a common method where waste is compacted and buried, though it poses environmental risks such as

groundwater contamination. Incineration another method burns waste to generate energy but requires careful emission control to mitigate air pollution.

In short, a combination of these methods tailored to local conditions and waste composition offers the best approach.

①

Anemia: It is a medical condition characterized by a lack of healthy red blood cells or haemoglobin in blood. This results in reduced oxygen carrying capacity.

Appendicitis: It is the inflammation of appendix, a small pouch located near the junction of the small and large intestine. It typically causes abdominal pain.

Spleen: It is an organ located in the upper left part of the abdomen. It plays important role in filtering the blood, storing red blood cells and platelets, and fighting infection.

Myopia: It is also called nearsightedness. It is an error of the eye in which close objects can be seen clearly but distant objects appear blurry.

Isotones: It refers to the atoms or ions that have same number of nucleons (proton and neutron) but different number of protons.

Section - II

Question no 07

(a)

$$\text{radius} = 30\text{cm} = \frac{300}{100} = 0.3\text{m}$$

$$\text{height} = 1\text{m}$$

Volume ?

We know the volume of cylinder

$$V = \pi r^2 h \rightarrow \text{①}$$

put values.

$$V = 3.14 (0.3)^2 (1)$$

$$V = 3.14 \times 0.9$$

$$V = \frac{99}{35} \text{ m}^3$$

(b)

Average Age = 15 years

Ages ratio = 3:5:7

Age of the youngest boy?

Sum of average ages = $15 + 15 + 15 = 45$ years

Sum of ratio = $3 + 5 + 7 = 15$

Now $\frac{3}{15} \times \frac{45}{1}$ = $\boxed{9 \text{ years}}$ is the age of the youngest boy.

(c)

ii 11, 13, 17, 19, 23 25

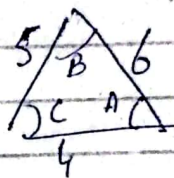
b/c it add 2 and 4 alternatively.

(d)

sides of triangle

5cm, 4cm and 6cm

Each angle?



For C

we know

$$c^2 = a^2 + b^2 - 2ab \cos(C)$$

$$6^2 = 5^2 + 4^2 - 2(5)(4) \cos(C)$$

$$36 = 41 - 40 \cos(C)$$

$$40 \cos(C) = 41 - 36$$

$$\cos(C) = \frac{a^2 + b^2 - c^2}{2ab} = \frac{5^2 + 4^2 - 6^2}{(2 \times 5)(4)}$$

$$\cos(C) = \frac{5}{40} = 0.125$$

$$\cos(C) = 0.125 \Rightarrow C = \cos^{-1}(0.125)$$

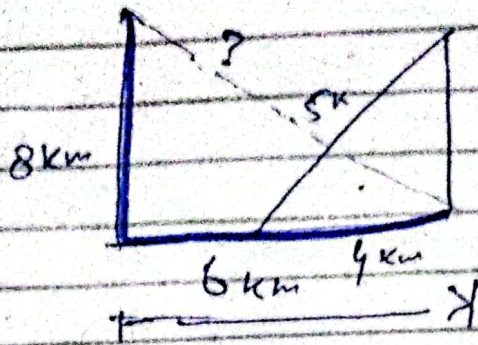
$$C = 89.9^\circ$$

$$\text{For A} \quad \frac{\sin(A)}{a} = \frac{\sin(C)}{c} = (\quad)$$

$$\text{For B} = 180 - A - C = (\quad)$$

Question no 8

(a)



He has travelled for $6\text{ km} + 8\text{ km} = 14\text{ km}$

As we can see a right angle triangle.

of base 6 km and perpendicular 8 km.
Apply Pythagoras theorem

$$(\text{Hyp})^2 = \text{Bas}^2 + (\text{Perp})^2$$

$$1 \cdot \text{Hyp}^2 = 8^2 + 6^2$$

$$\text{Hyp}^2 = 64 + 36$$

$$\text{Hyp}^2 = 100$$

$$\text{Hyp} = \sqrt{100} \Rightarrow \boxed{\text{Hyp} = 10\text{ km}}$$

It means he is 10 km away from starting point.

(b)

$$\text{RC} = 4320$$

$$\text{Ratio: } 8:3:7 = 18$$

$$\text{Zain share} = \frac{8}{18} \times 4320 = 720$$

$$\text{Asta share} = \frac{3}{18} \times 4320 = 1080$$

$$\text{Ashraf share} = 4320 - 720 - 1080 = 2520$$

$$r = 7 \text{ m}$$

(c)

$$\text{Surface Area of Sphere} = 4\pi r^2$$

$$\text{Volume of Sphere} = V = \frac{4}{3}\pi r^3$$

$$A = 4\left(\frac{22}{7}\right)(7)^2$$

$$A = (4)(22)(7)$$

$$A = 88 \times 7 = 616 \text{ m}^2$$

$$V = \frac{4}{3}\left(\frac{22}{7}\right)(7 \times 7 \times 7)$$

$$V = \frac{4}{3}(22)(49)$$

$V =$