(1)

Section-1

Q no-4
4(a)

<u>Floods</u>: When water level increased from carrying capacity of a water body (lake, river, ocean), it results in overflow of water called flood. According to William Shakespeare;

"Great floods have flown from simple sources."

<u>Main Causes of flood</u>:- following are main causes of flood;

1- Torrential rains:

Excessive torrential rains leads to water in excess amount which emerged in form of ~~water~~ flood because of no systems for tackling with it.

Floods in Pakistan in 2022 ~~were~~ were because of eight cycles of moonsoon rains.

2- Glaciers melting:

Glaciers melt in summer has increased level nowadays because of global warming. They cause floods in areas from where

their water flows.
Fifteen million people worldwide are at risk of glacial lake flooding, with two millions of them in Pakistan

~~2023~~ -2023 -scientific journal Nature communications Report.

3- Hurricanes flooding towns:

when a hurricane strikes a coastal area, it brings a number of serious hazards. These hazards include heavy rains, high winds and pushes seawater on shore, flooding towns near coast.

4 - Deforestation:

lack of trees means that more water readily runs off on surface without being intercepted. It leads to smooth flow of floods.

5- Dams ~~infrastructure~~ infrastructures:

In event of huge rainfall, the dams built begin to collapse. Thus making flood situation worse

How Floods of 2022 were different from super floods of 2010

2022 Floods	2010 Floods
1) From 15 June to October 2022, floods in Pakistan were due to; a) 8 cycles of moonsoon rains b) Melting glaciers that followed a severe heat wave	These floods were in late July, 2010, resulting from heavy moonsoon rains which affected Indus river basis. It is only moonsoon rain that caused these super floods in Pakistan. These floods affected a) Punjab Sindh b) Baluchistan, KPK
2) They affected one third area of Pakistan.	2) They affected one fifth area of Pakistan. But they were high to very high floods.

NDMA (National disaster management Authority) role in floods

① There was no epidemic because of NDMA measures after floods.

② The return of displaced people to shelter areas was facilitated by NDMA.

③ WATAN cards were launched to support victims of 2010 flood by Pakistan NADRA

(4) NDMA attracted foreign people through media to collect funds for victims of 2022 floods.

In late September 2022, Angelina Jolie spent 3days in Pakistan meeting with with residents who were preserving after severe floods.

4(b)

Star	Planet
1) It is a luminous ball of gas, mostly hydrogen and helium, held together by its own gravity.	1) Any of the large bodies that revolve around the sun in solar system.
2) There are billion trillions of stars in sky.	2) There are eight planets; a) Mercury e) Saturn b) Venus f) Neptune c) Mars g) Uranus d) Earth h) Jupiter.
3) Uy Scuti is largest star in universe.	3) Largest planet is Jupiter and smallest one is mercury
4) Proxima centauri is closest star to our planet	4) Mercury is closest to sun and Neptune is farthest.
5) stars revolve around pole star	5) Sun is a star around which all planets revolve.

Formation of Blackhole from a star :-

Stellar black holes form when center of a very massive star collapses in upon itself. This collapse also causes supernova or exploding star that blasts part of star into space.

```
            ┌──────────┐   ┌──────────┐   ┌────────┐      ⟶ white
            │Smaller star│  │Red giant │   │Nebula  │         dwarf
┌────────┐  └──────────┘   └──────────┘   └────────┘
│Stellar │
│cloud   │                                             ⟶ Neutron
└────────┘                                                 star.
            ┌──────────┐   ┌──────────────┐ ┌─────────┐
            │Large star│   │Red Supergiant│ │Supernova│  ⟶ (Black
            └──────────┘   └──────────────┘ └─────────┘      Hole)
```
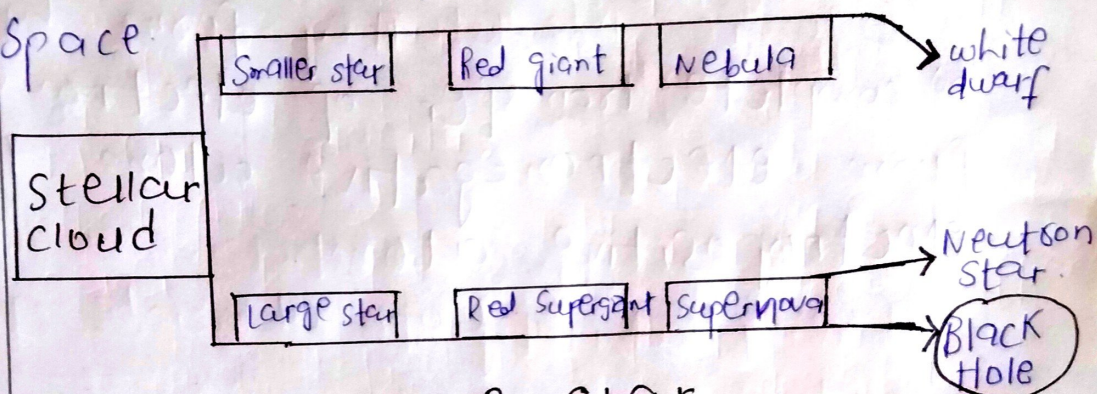
(Life cycle of star
for Blacke Hole)

4(C)
Reason of atoms forming chemical bonds :- Atoms form chemical bonds because of following 3 reasons:
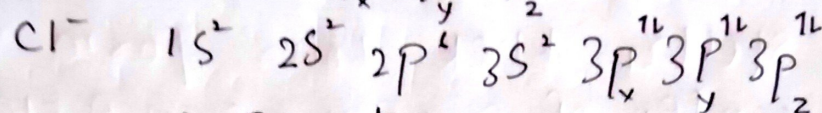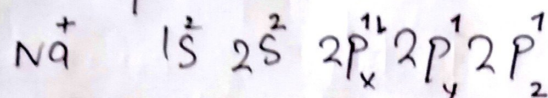
1- To gain stability: Everything in world wants to become stable. So, atoms also want to gain stability.

2- To decrease their energy: Atoms form bonds to decrease their energy to gain stability.

3- To complete their octet and duplet rule: Atoms want to complete their duplet (attaining of two electrons.

Exmple of Duplet Rule: H_2 (Hydrogen gas), He

Example of octet rule : NaCl (sodium chloride)

Na^+ $1s^2\ 2s^2\ 2p_x^{1\!\!\downarrow}\ 2p_y^1\ 2p_z^1$

Cl^- $1s^2\ 2s^2\ 2p^6\ 3s^2\ 3p_x^{1\!\!\downarrow}\ 3p_y^{1\!\!\downarrow}\ 3p_z^{1\!\!\downarrow}$
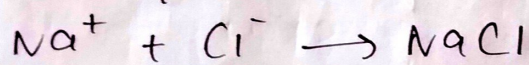
chemical Bonds of Atoms:

Atoms form following 2 types of chemical bonds:-

① Ionic Bonds: They form by complete transfer of electrons from electronegative atom to electropositive atom.

Example: sodium chloride

$Na^+ + Cl^- \longrightarrow NaCl$

② Covalent Bonds: They form by mutual sharing of electrons between atoms.

Example: CH_4, H_2

③ Coordination covalent Bond: When donor atom donates electrons to electron deficient atom then this dative bond is formed.
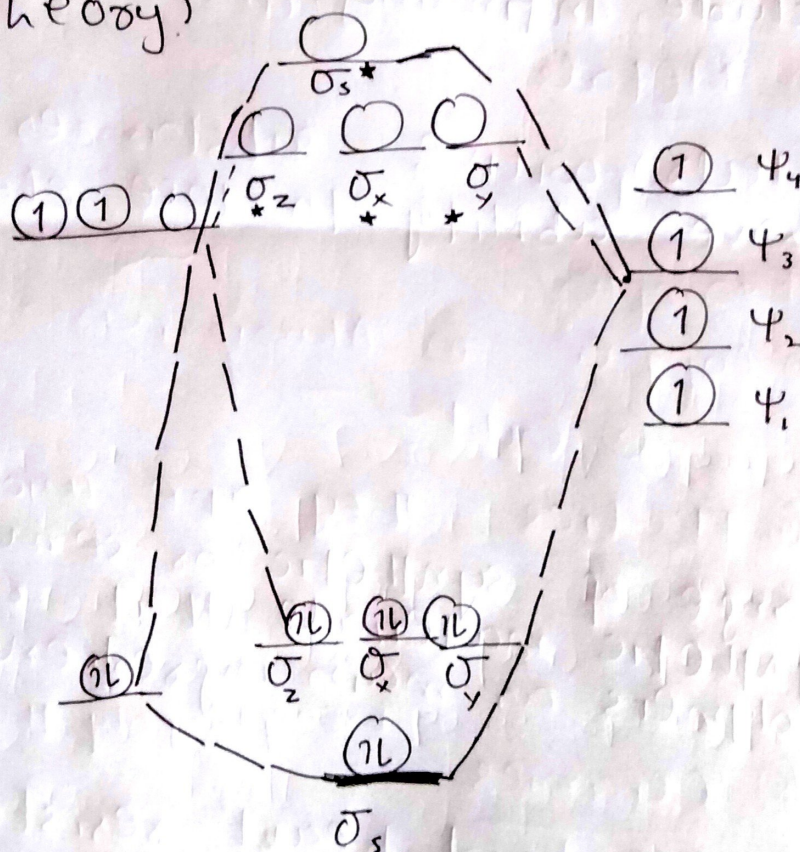
Example: NH_3 and BF_3 form this bond

7.

Structure of water:

water Bonds

(a) Following Bonds are in water;

polar covalent Bonds.

(b) Following Bonds are among water molecules;

Hydrogen Bonds.

water structure:

water structure can be explained through MOT (Molecular Orbital Theory)

4 (d)

Conductors :- They are substances which allow movement of electrons. There are 2

types of conductors :-

1- Electric Conductors : Pure Silver
Best conductor

2- Thermal Conductors

② Semiconductors :- They are materials used in electrical circuits and components that partially conduct electricity.
Examples: Elemental semiconductor include; Antimony, Arsenic, Boron.

③ Metals :-

Electropositive substances which have ability to lose electrons.
Examples:
① Copper ② Aluminium
③ Gold.

④ Plastics :- They are wide range of synthetic or semi synthetic materials that use polymers as main ingredient.
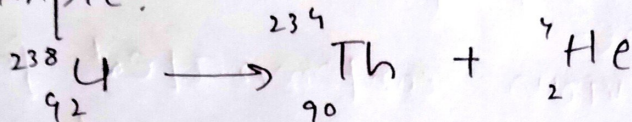Example : polyethylene

⑤ Ceramics :-

Brittle, hard, heat resistant, corrision resistant materials made by shaping and then firing inorganic, non-metallic material (clay) at high T. Example: Porcelain

9

5 (a)

Radioactivity :- It is process of release of energy from decay of nuclei of certain kinds of atoms and isotopes.

Example :-

$$^{238}_{92}U \longrightarrow \,^{234}_{90}Th + \,^{4}_{2}He$$

Natural radioactivity	Artificial radioactivity
① Heavy elements having atomic number greater than 83 like uranium, thorium exhibit natural radioactivity	① Both light and heavy elements exhibit artificial radioactivity.
② It occurs spontaneously	② It occurs in presence of external influence.
③ most of times, this process cannot be controlled.	③ This process is controllable
④ Example: uranium does natural radioactivity	④ Example: Americium-241 does artificial radioactivity.

Polio:-

Poliomyelitis is an infectious disease caused by poliovirus. It causes mild or no symptoms in some people. But it cause paralyzes in some people.

Causes:-

polio virus contaminated food

polio virus contaminated water

not using polio vaccine.

Symptoms.

Fever

Fatigue

Stiffness of neck

Pain in limbs

Severe muscle ashes

menigitis

paralysis

Fears of children's health as polio re-emerges in Gaza in August, 2024.

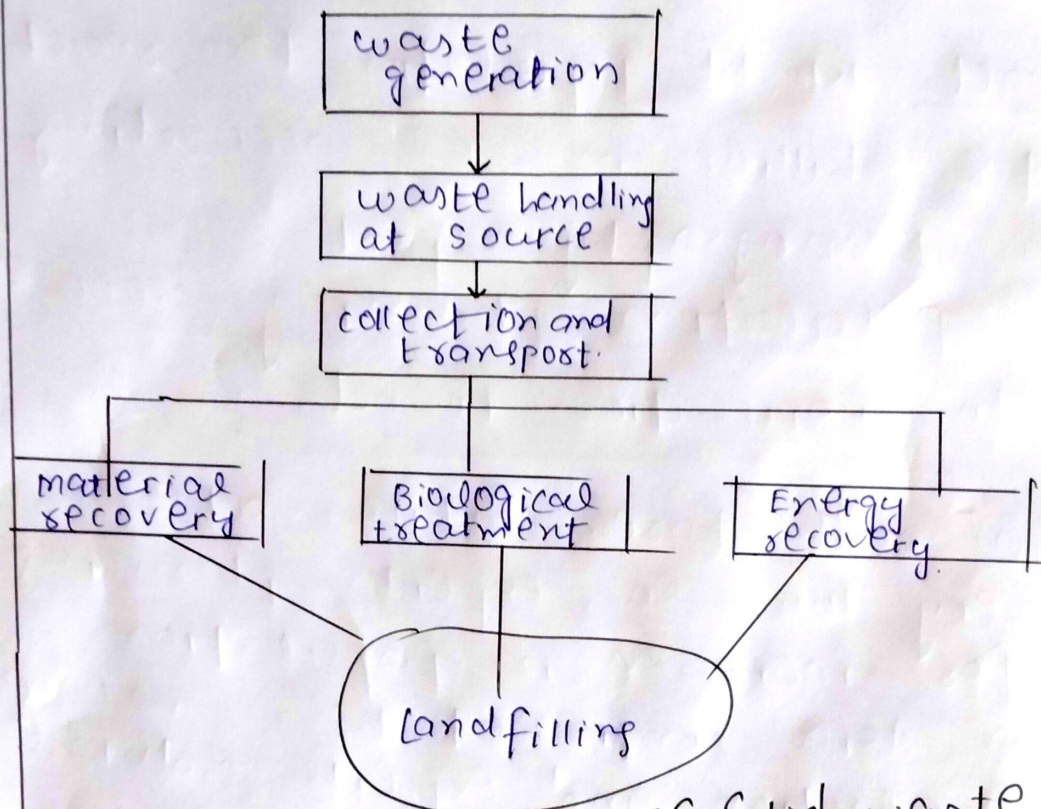### Prevention

① use polio vaccine

② Avoid using contaminated food which have suspect of polio virus ③ immunization vaccine:- IPV (Inactivated poliovirus vaccine)

5(C)

Solid waste management:

It refers to complete process of collecting, treating and disposal of solid wastes.

steps:-

```
┌─────────────────┐
│ waste           │
│ generation      │
└────────┬────────┘
         │
         ▼
┌─────────────────┐
│ waste handling  │
│ at source       │
└────────┬────────┘
         │
         ▼
┌─────────────────┐
│ collection and  │
│ transport.      │
└────────┬────────┘
         │
  ┌──────┼─────────────────┐
  ▼       ▼                ▼
┌──────────┐  ┌──────────┐  ┌──────────┐
│ material │  │Biological│  │ Energy   │
│ recovery │  │treatment │  │ recovery │
└──────────┘  └──────────┘  └──────────┘
         \        |        /
          \       |       /
           (   landfilling   )
```

Issues / challenges of Solid waste management in pakistan:

1- No proper waste collection system

2- waste is dumped on streets

3- There are no controlled sanitary landfill sites

4- Citizens are not aware of waste disposal.

5 (d)

Population Planning:-

Practice of managing growth rate of a human population. It deals with overpopulation in demographic studies.

Fact: World Population has reached $ 8.2 billion in 2024 according to Demography report.

Population Planning according to population trends :-

(a) South Korea fertile rate is very low. So; experts planning for increase in population

(b) Asia continent has more population and experts advise population decrease in this region

Benefits of Population Planning

1- It reduces poverty
2- It saves lives of mothers and babies
3- Its main benefit is empower-ment of women by controlled birth rates
4- More resources for controlled population