

Answer no # 4

A) Temperate Cyclone Tropical Cyclone

Temperate cyclones form in the temperate region between 30° to 60° North and South.

Tropical cyclone forms in the tropical region between 10° to 30° degree North and South

Temperate cyclone can form both over the sea or ocean and land

Tropical cyclones form only over the sea or oceans. where sea surface temperature is 27° or more

Temperate cyclone forms due to Coriolis force, maximum of air and convergence of two different properties air masses.

Tropical cyclone forms due to thermal convection.

Maximum number of Temperate Cyclones form in winter season.

Maximum number of Tropical Cyclones form in Summer season.

Shape of a Temperate cyclone is like inverted V.

Shape of a Tropical cyclone is elliptical

Diameter of a ^{temperate} tropical Cyclone is generally ^{large} small. It is about 300-2000 km

Diameter of tropical cyclone is generally small, about 100-500 km

Isobars of the Temperate cyclones are V shaped and pressure gradient is comparatively gentle	Isobars of tropical cyclones are in round shaped and pressure gradient is very steep.
Temperate cyclones are less dangerous as its wind speeds is lower generally 30-150 km per hour.	Tropical cyclone is more dangerous as its wind speed is higher generally 100-250 km per hour.
Most of destruction occur due to flooding	Most destruction occur due to strong winds, storm surge & heavy rain.
Last for a long period of time generally from 15-20 days.	Lasts for a short period of time generally from few hours to seven days.
Eye of the cyclone is absent no such place where wind remains calm	Eye of the cyclone can be seen in the center where wind remains calm, sky remain clear and no rain.
Fronts forms between two different properties of air masses.	Front does not form in tropical cyclones
Slow and continuous rain occurs for a long period of time.	Rain occurs intensely for a short period of time

Different densities air masses contribute the energy of the temperate cyclone.

Tropical cyclone gets energy from the latent heat of condensation.

There is distinct relationship between cyclone and upper level air flow.

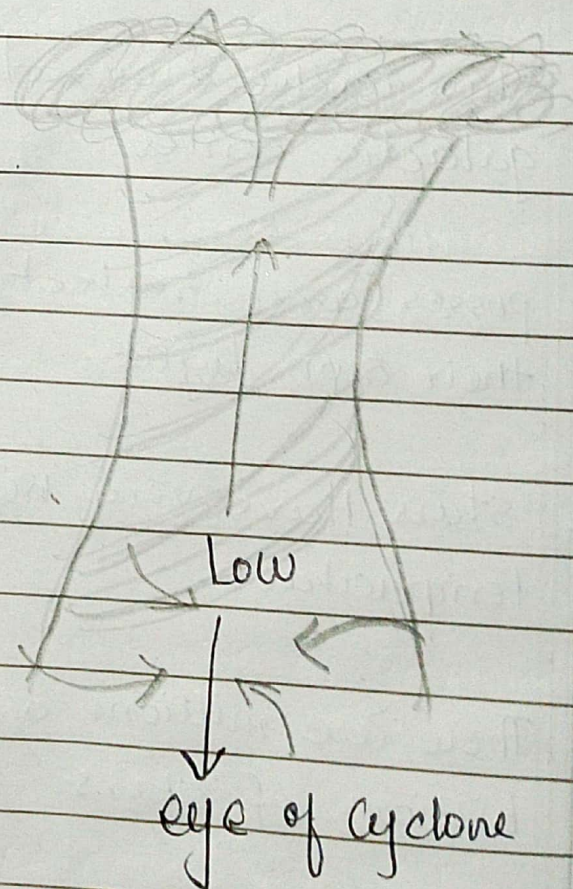
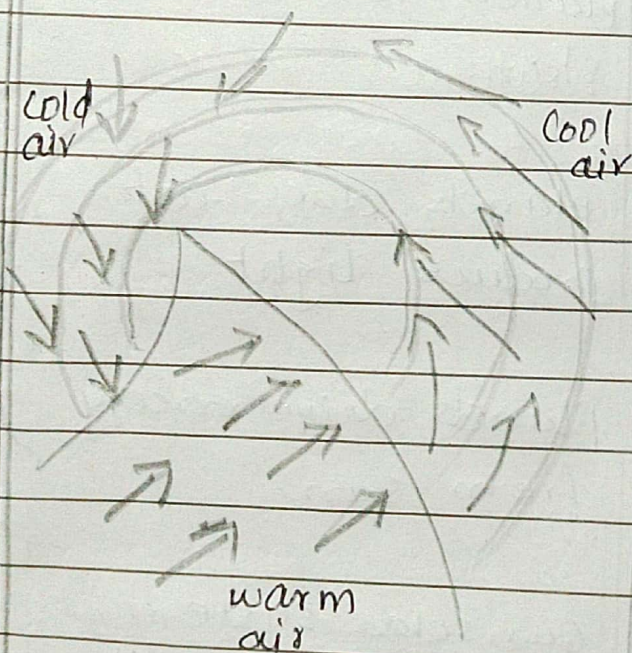
There is no clear relationship between the cyclone and upper level air flow.

Moves from west to east

Moves from east to west

Extratropical cyclone, wave cyclone or midlatitude cyclone

Typhoon, hurricane, cyclone



B)

StarPlanet

- | | |
|---|---|
| 1- massive sphere of hot gas | Round body in space orbiting star. |
| 2- stars shine and are very hot. | planet does not shine neither they are hot. |
| 3- Objects revolve around are planets, dwarf planets. | Objects revolve around called satellites |
| 4. Stars revolve around galactic center | planets revolve around star. |
| 5- possess and reflect their own light | planets does not produce light |
| 6- stars have very high temperature | planets derive energy from sun. |
| 7 There are millions and billions of stars. | Our solar system has only 8 planets |
| 8- stars undergo a life cycle | planets do not have life cycle. |

Black Hole formation:

a) Massive stars:

Stars which are six times as massive as our sun are called massive stars.

b) Collapse of Massive stars and formation of supergiant:

A massive star has short lifespan than the sun or other low-mass stars. Hydrogen in the core of a massive star is used up with fast speed. After only 50 to 100 million years, no hydrogen is left in the core of a massive star. Thus, core collapses and star becomes 1000 times greater than its original size - called supergiant.

c) Super Nova:

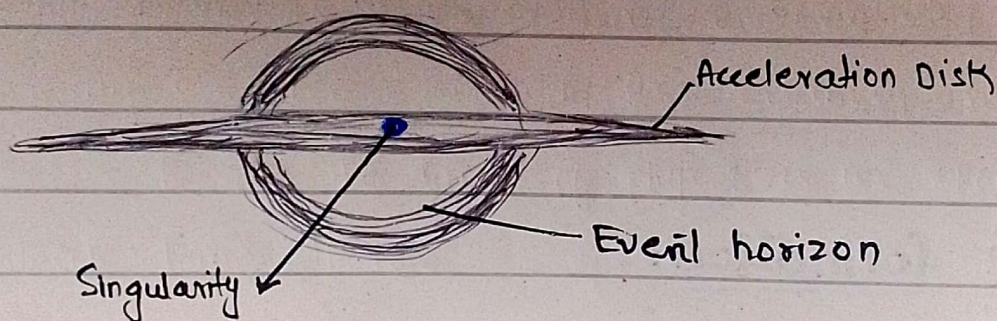
With the passage of time, the supergiant becomes so dense that it cannot bear the pressure of outer layer. The outer layer crashes inward with a tremendous explosion called supernova.

d) Formation of Neutron star:

At supernova, light of the star becomes much more than all other stars in the galaxy. Great shell of gases fly off the star. Only tiny core of the star remains that contains only neutrons - so called neutron stars.

e) Formation of Black Hole:

Neutron star is extremely dense. Sometimes after Supernova, star becomes blackhole - a dense part black hole is the last stage of the life of a massive star.



• Massive star (10x bigger than sun)



• Nuclear fuel Exhausted



• Supernova Explosion



• Core collapse due to gravity



8)

star

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Planet

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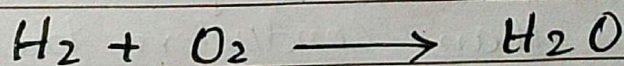
iii) C

Why atoms form chemical bonds?

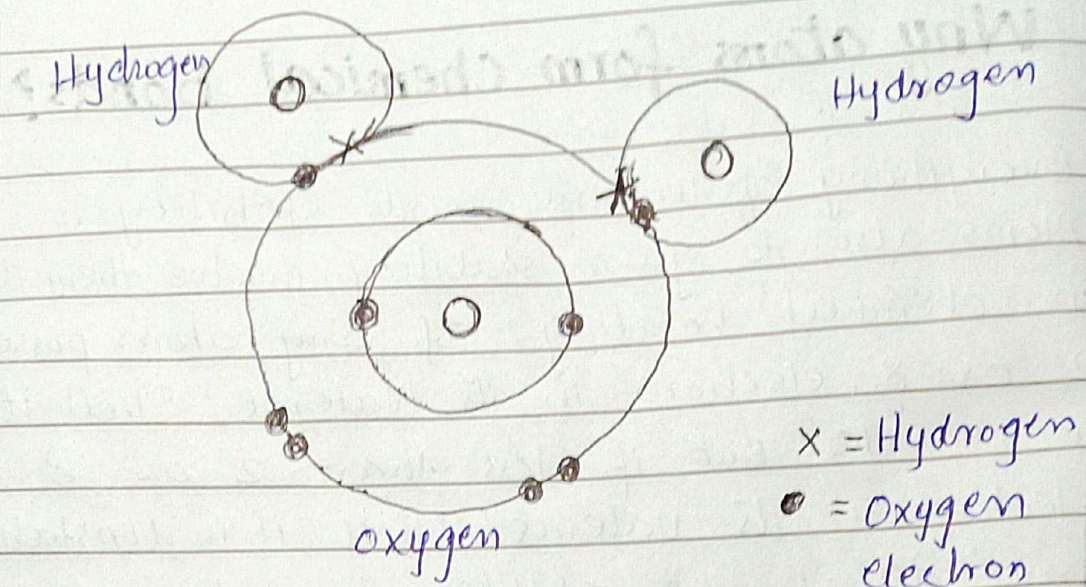
Everything of universe wants stability. Atoms also to gain stability involve themselves in chemical bonding. If any atom possess 2 or 8 electrons in its Valence Shell it is stable, But if less than 2 or 8 electrons in its valence shell it is unstable. In order to be stable atom form a bond with other atom to complete its valence shell as well as the valence shell of other bonding atom. Obtaining electrons to complete 2 electrons is called duplet rule and obtaining 8 electrons to complete valence shell is called octet rule.

Structure of water

water is formed when: two atoms of hydrogen combine with one atom of oxygen.



Each hydrogen atom is covalently bonded to oxygen through a shared pair of electron. In this way both hydrogen atoms and oxygen atom become stable and form a molecule of water.



D)

Conductor:

Those materials which allow the electricity to pass through them easily without much resistance are called conductors.

Example:

Copper, aluminium, iron etc.

Semiconductor:

Those materials which partially allow the electricity to pass through them. They conduct electricity less than conductors but greater than insulator.

Example:

N-type semiconductor

P-type Semiconductors

Plastics:

Plastics are synthetic organic materials that can be shaped into variety of products under heat, made up of long, chainlike molecules, called polymers.

Example:

Thermoplastics, polyethylene, polytyrene, polyamide

Ceramics:

A ceramic is an inorganic, non metallic solid material comprising metal, non metal or metalloids atoms primarily held in ionic and covalent bonds.

Example:

crystalline, non-crystalline

Metal:

All elements except hydrogen, which form positive ions by losing electrons during chemical reactions are called metals. Metals are solid under normal conditions except for mercury.

Example:

gold, silver, copper, mercury.

Section - II

Answer # 6

a)

First number = x

Second number = $x+1$

Third number = $x+2$

Sol:

$$x + (x+1) + (x+2) = 159$$

$$3x + 3 = 159$$

$$3x = 159 - 3$$

$$3x = 156$$

$$x = \frac{156}{3}$$

$$x = 52$$

First number = $52 = 52$

Second number = $52+1 = 53$

Third number = $52+2 = 54$

The sum of 52, 53 and 54 is 159.

b)

radius = 6 cm

perimeter of circle = ?

$$\text{perimeter of circle} = 2\pi r$$

$$= 2(3.142)(6)$$

$$= 37.70 \text{ cm}$$

Ans

c)

present age of a man = x
age of wife = y
age of child = z

Average age before 3 years (man, wife & child)

$$\left(\frac{x+y+z}{3}\right) - 3 = 27 \rightarrow (i)$$

Average age of wife and child before 5 years

$$\left(\frac{y+z}{2}\right) - 5 = 20 \rightarrow (ii)$$

Taking equation (i)

$$\frac{x+y+z}{3} - 3 = 27$$

$$\frac{x+y+z}{3} = 27 + 3$$

$$x+y+z = 30 \times 3$$

$$x+y+z = 90$$

$$y+z = 90 - x \rightarrow (iii)$$

Taking equation (ii)

$$\frac{y+z}{2} - 5 = 20$$

$$\frac{y+z}{2} = 20 + 5$$

$$y+z = 30 \times 2$$

$$y+z = 60 \rightarrow (iv)$$

By Comparing eq (iii) and (iv)

$$90 - x = 60$$

$$-x = 60 - 90$$

$$x = 40$$

$$x = 40$$

Present age of man is 40.

d)

1st number : 2nd number : 3rd number

$$2 : 3 : 8$$

$\swarrow \quad \uparrow$
 $5 \quad 5$

$$10 : 15 : 24$$

~~Math~~ $10 + 15 + 24 = 49$

as we know, $\frac{98}{49} = 2$

So, multiply by 2

$$2(10 + 15 + 24) = 2(49)$$

$$20 : 30 : 48 = 98$$

$$\text{Second number is } 30$$

Answer 7

a)

Sum of two numbers = 23

Product of numbers = 132

First number = x

Second number = y

x	23
y	132

$$12 \times 11 = 132$$

$$12 + 11 = 23$$

So,

First number = 11

Second number = 12

b)

40% of $x = ?$

20% of 650

$$\frac{20 \times 650}{100} = 130$$

$$130 + 190 = 320$$

So,

40% of $x = 320$

$$\frac{40 \times x}{100} = 320$$

$$40x = 320 \times 100$$

$$x = \frac{32000}{40}$$

$$x = 800$$

c)

Cost price = 70 million = 7 Crore

Discount = 20% = 0.20

$$\text{Market price} = \frac{\text{Discounted rate}}{1 - \text{Discount rate}}$$

$$= \frac{7,000,000}{1 - 0.20}$$

$$= \frac{7,000,000}{0.80}$$

$$= 8,750,000$$

The market price of the car is
8.75 million

d)

If a number is increased by
10% and then decrease by 10%.

The net change in the number:

Assume number is 100

- 10% of 100 = 10
So, $100 + 10 = 110$

- 10% of 110 = 11
So, $110 - 11 = 99$

So, the net change is of 1%.