Part-II
Section #A

Q#5
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Avalanche

An avalanche is a rapid and seden movement (mass movement) of snow and ice from mountainside due to the force of or effect of gravity.

Origine

Avalanche is a french word that means "Descent."

Types of Avalanche

There a basically two types of avalanche that frequently happen.

i) loose Snow Avalanche
ii) slab Avalanche

→ Loose Snow Avalanche

The fall of snow is slopy and is less cohesion. It appears in a "v" pattern on the snow slop. They are rarely large enough to do significant property damage.

→ Slab Avalanche

It occures when a cohesion layer of snow slides the slop. They are formed by the flow of wind and are from new snow.

Causes of Avalanche

The causes of Avalanche can be catagorisid into four types.

1- Terrain-related factors

Factors causing Avalanche are, Slop Size, Slop Shape, slop sphere etc.

2- Snowpack related factors

layers of snow build-up and slide down the mountains at a high speed. Through Steepness of Slop.

3- Weather-related factors.

Heavy Snowfall causes the occurance of avalanche.

Precipitation during Summer is the main cause i.e Nowadays adverse change in climate.

4-Man-Related Factors.

Human activities has advesly effect the Pattern of Snowfall. Winter sports, heavy deforestation and use of vehicals and Snowmobiles are causig

avalanche.

The construction work is also weakens the structure.

[redacted]

Parb - b

Electromegnetic - Radiations

Electromegnetic radiations is a type of radiations that surrounds us all the time. EM radiation are those which need "no medium for their propogation."

- Common Types of EM radiations

Light rays. Radio waves.

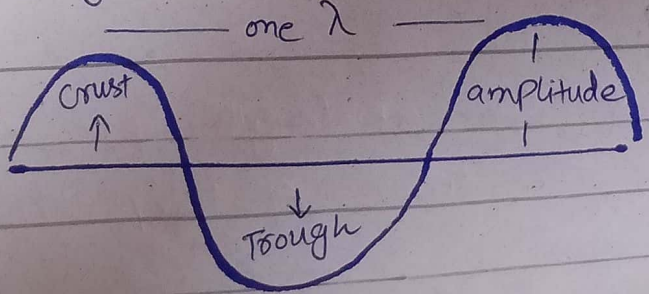
Microwaves X - Rays

Gamma rays

while visible light contributes to a small portion of EM-radiations and have a broder wavelength (400-700nm VIBGYOR)

Amplitude of EM-radiation

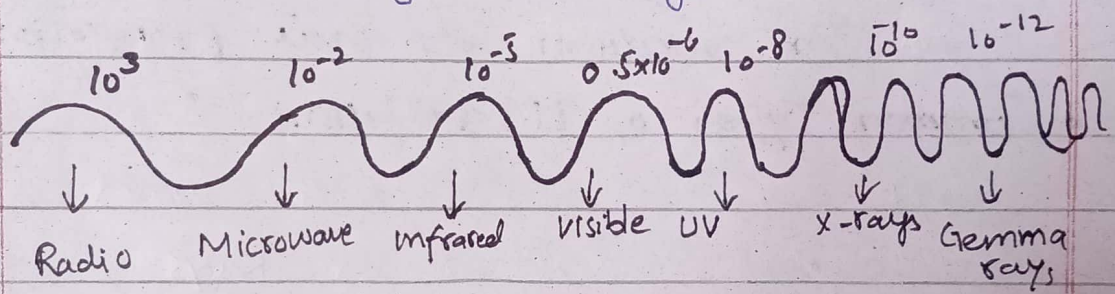
- Amplitude is the measure that how big the wave is
- upper light is crest and lower height is trough.



The frequency of EM could be found by formula. $V = f\lambda \Rightarrow f = V/\lambda$

Electromegnetic Spectrum

The spectrum of EM-radiations is determined by examining the rate of frequency and wavelength, i.e, increasing frequency and decreasing wavelength.



Radio Waves

These are longer wave i.e 1mm to KM They have ~~high~~ longer wavelength and shorter frequency. They are used in satellites, radar and computer networking.

Microwave

This type of waves are shorter than radio waves. They are used in micro wave ovens to cook food

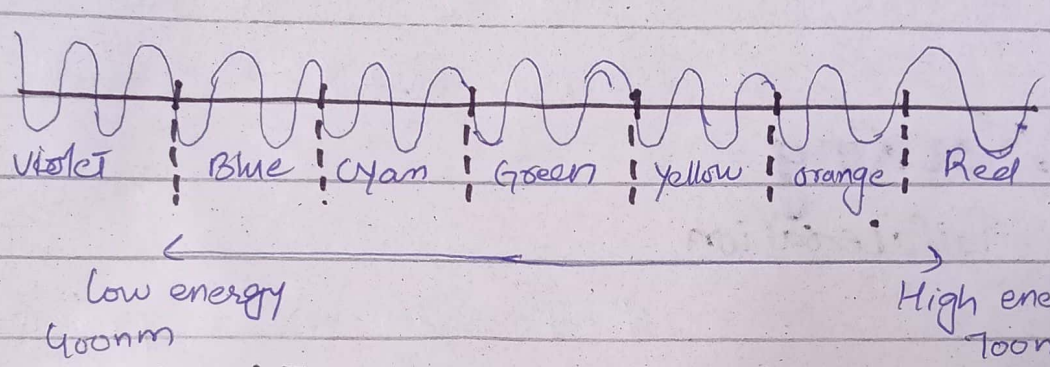
Infra-red.

Infra-red ~~span~~ wavelength span is from 710 nm to 1mm. At temp 37°c, our body emit these waves.

They are used to treat Strained Muscles and tissues.

Visible light

Visible light ranges from 350-700 nm. Our sun emits visible light and also the colors of rainbow.



Ultraviolet

Their wavelength ranges from 10-310 nm. Hot stars produce/emit such waves.

X-Rays

X-Rays are ranging from 0.01 - 10nm They can penetrate soft tissues like skin and muscles and are used to take picture of bones of body.

Gemma rays.

Gemma rays have very shorter wavelength i.e 0.01 nm. This is the most energetic region of EM waves.

They are use to sterilize food and research equipments

Part-C

GPS

GPS, is a global positioning system, is a satellite based navigation system that allows users to determine their precise location anywhere in earth. It operates by employing a network of at least 24 satellites orbiting around the planet.

Working

Trilateration

The working of GPS relies on a process called trilateration. GPS recievers on the ground communicate with multiple satellites simultaneously. Each satellite continously broadcasts its own precise location and the time the signal was sent.

Distance Measurement

The GPS reciever calculates the its distance from each satellite based on the time it took for the signals to arrive. By measuring the "Time delay" b/w when the signal was transmitted and when it was recieved, the reciever can determine the distance of each satellite

Positioning

once GPS receiver has calculated its distance from at least four satellites, it uses its information to trilaterate its exact position on Earth's surface. Trilateration involves finding the "intersection point of spheres centered on each satellite", where the radius of each is the calculated distance from the GPS receiver to the satellite

Usage :-

GPS can provide real-time accurate positioning info, enabling navigation, tracking, and a wide range of location-based services that we use in our daily lives.

Part-d

Computer

is an electronic device, that is used to store and manipulate the raw facts and figures into useful information.

Computer Buses

computer buses are facilitators for the transmission of data, instructions and control signals b/w various hardware components within a computer system

Types of buses

Data bus

It carries data b/w CPU, memory, and peripheral devices. It allows data to flow in both directions.

Address bus

This is uni-directional bus it transfer memory addresses generated by the CPU to access specific locations in memory or devices.

Control bus

Responsible for transmitting control signals that manage data flow and coordinate activites b/w components

CPU: Brain of computer.

The CPU is a microprocessor chip that is a single piece of "silicon" containing millions of tiny, microscopically-wired electrical components. Information is stored in CPU and this memory location is called **register.**

CPU is divided into two separate operating.

ALU

It performs arithmatic operation (+, -, x, ÷, >, <)

CU

It supervise the things are doing well or not

Q#4 (b)

Water Scarcity

It refers to a situation in which the demand exceeds the available supply of freshwater resources in a particular region.

Measues to Deal Water Scarcity

Preventing water scarcity requires a combination of conversation efforts, sustainable practices, and efficient water management. Here are few measures.

Implementation of Techniques.

Implementing water-saving techniques and practicing, such as ~~wate~~ rain water irrigation.

water-conservation Awarness

Promoting water conservation through public awareness.

Industrial water Management

Encouraging industries to recycle water

Protection of water sources.

Protecting water sources from pollution and over-extraction.

Water infrastructure Investment

Investing in infrastructure, including reservoirs and water storage system

Water use Regulations and pricing

Enforcing strict water usage regulations and encouraging responsible consumption.

Sustainable Agriculture

Developing sustainable practices.

Research and innovation

- Investing in research and innovation for water conservation

Regional Collaboration

collaboration is a way to manage water resources effectively

Groundwater Management

to avoid depletion of aquifers.

Q#4 (c)

Vaccines

The methode of stimulating resistance in human body to specific diseases-causing micro-organisms such as bacteria or virus is called vaccination.

Types of Vaccines

There are a few different types of vaccines. They include:

Attenuated

Live viruses are used in some vaccines such as in the measles, mumps, and rubella (MMR) vaccine.

Killed (inactivated)

Viruses and bacteria are used in some vaccines, such as in IPV

Toxoid vaccines.

It contains an inactivated toxin produced by the bacterium. e.g. tetnus vaccine.

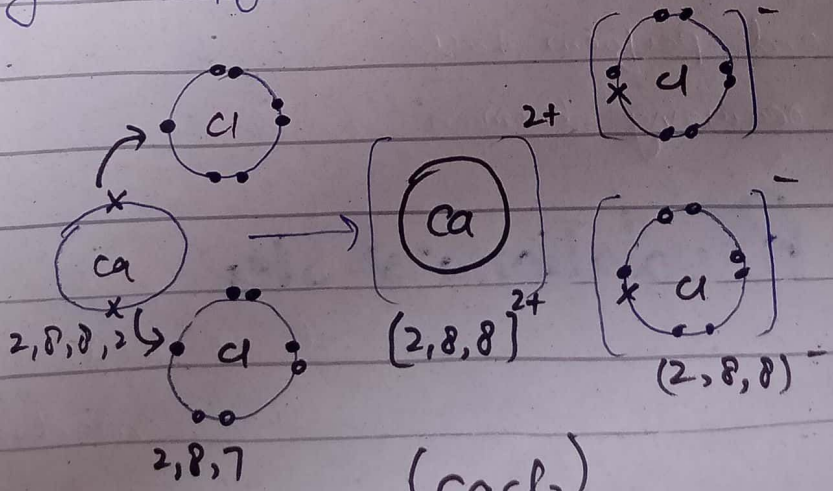
Conjugate vaccines

contain part of bacteria combined with proteins e.g Hib.

Q#15(c) 4(d)

Ionic bond

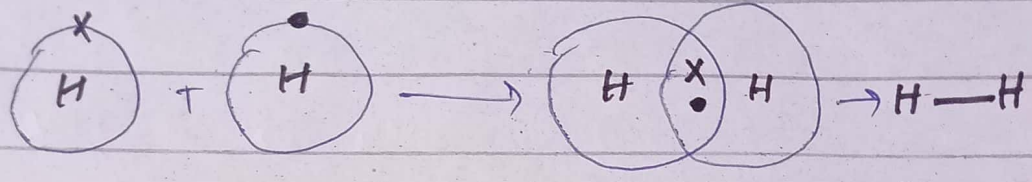
One or more atoms lose e's and other atoms gain them in order to gain the noble gas configuration, is called Ionic bond.



$(CaCl_2)$

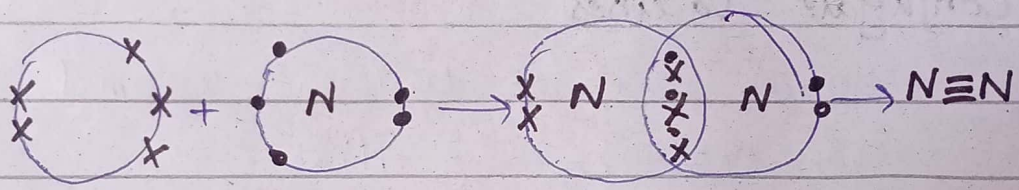
Covalent bond

By the mutual sharing of electrons in non metal atoms, they share one, or more, pair of electrons, a covelent bond is formed.



Hydrogen atoms sharing a pair of e's

Multiple covelent bonds



Nitrogen Moleule

Q#: [redacted] 4(a)

Artificial Intellegence

AI, or artifical intellegence, refers to the simulation of human intellegence in machines that are programmed to think and perform tasks typically in seconds requiring human intellegance.

Revolutionary Step

AI has indeed revolutionized the world by enabling machines to

Perform tasks that typically require human intellegence. Here are few features.

1- AI's automatic capabilities have make a more ease.

2. Breakthroughs in healthcare.
   ↳ it has made easy to diagnostic treatment and drug recovery.

3. AI have personalized experiences in e-commerce, entertainment, and social media

4- AI enable faster and more accurate data analysis.

5- AI's integration has transformed sectors like finance, transportation, and manifacturing.

Thus AI has revolutionarized the world.

Section-B

Q#6 (a)

Five year ago father age = F - 5

Five year ago son's age = S - 5

(F - 5) = (S - 5)

∵ current age of son is 30 years (S = 30)

(F - 5) = 3(30 - 5)

(F - 5) = 3(25)

$F - 5 = 75$

$F = 75 + 5 \Rightarrow F = 80$ years

The current age of father is 80 years.

Q#16 (b)

10% of $x = 1500$

Now

$0.10x = 1500$

$x = 1500 / 0.10$

$x = 15000$

So, The man's income is Rs 15000

Q#16 (c)

Arithmetic mean of 6 no = 20

" " of 1 num = 20 * 6

Now if we remove one num, there left 5 numbers, The average of remaining is 15 as elobrated in question.

lets assume

$S = 20 * 6$

$S' = 5 * 15$

The no. removed is $= S - S'$

$= (6 * 20) - (5 * 15)$

$= 120 - 75$

$= 45$

Q#6 (d)

i) 8, 4, 32, 7, 5 ——

8, 4, 32, 7, 5, 35

ii) 7, 19, 23, ——29——, 31, 37

7, 19, 23, 29, 31, 37

Q#8 (c)

Total Profit = 406,000

Tahir's Investment = 15,000

Umair Invest after 9 Month = 30,000

Usman " " 9 " = 45,000

Now

Tahir's share = (Tahir investment / ~~Total~~ Invest) * Profit

= 15,000 / 90,000 * 406,000

(∵ Total Investment = 90,000)

Tahir's share = 67,666.67

Now

Umair's share = (30,000/90,000) * 406,000

= 135333.33

Now

Usman's share = (45,000/90,000) * 406,000

= 203,000

Q#8(d)

Total property = 640,000

Debt due to him = 40,000

Burial expense = 5,000

Remaining = 640,000 - 40,000 - 5,000

= 595,000

Widow's Share = $\frac{1}{8}$ * 595,000

= Rs 74,375

Daughter's share = $\frac{2}{3}$ * 595,000

= Rs. 396,666.67

Son's Share.

Remaing amout to share blw sons = 595,000

- widow's share - Daughters sha

= 595,000 - 74,375 - 396,666.37

= Rs 123,958.33

Share = Remaining / no. of sons

= 123,958.33 / 2

= 61,979.17 / son