

PART - II
SECTION - A
ANSWER: 3
(a)

PROTEINS:

Proteins are biological molecules that are made-up of dipeptide and polypeptide linkages. They have complex structures and serve as biological catalysts i.e enzymes.

Functions:

Proteins have diverse functions.

- i) structural proteins help in building muscles.
- ii) Proteins act as biomolecules - haemoglobin is a protein.
- iii) Proteins act as biological catalysts - enzymes.

Digestion:

The digestion of proteins takes place through various enzymes including:

- 1) Trypsin: Polypeptides \rightarrow amino acids
- 2) Amino Peptidase:
dipeptides \rightarrow amino acids

Sources:

Foods like meat, fish, grains, beans etc are rich sources of proteins.

Deficiency:

The deficiency of proteins causes harm to muscles and heart.

Carbohydrates:

Carbohydrates are nutrient materials present in more than **65%** of diet. They are essential building-blocks of the body.

Digestion:

Certain enzymes are involved in breakdown of carbohydrates into simpler sugars like glucose and lactose. They include:

- Amylase: Starch → glucose
- Maltase: maltose → glucose
- Lactase: lactose → glucose

Sources:

Components like wheat, oats, barley, maize, rice, corn etc are sources of carbohydrates.

Deficiency:

The lack of sufficient amounts of carbohydrates in food cause slowed mental function or mental retardation.

(b)

Atmospheric Pressure:

The term atmospheric pressure refers to pressure exerted by atmosphere (wrt altitude) on components around.

Denotation:

It is denoted by **atm** and measured in **parts per million**

(ppm)

Exemplification:

Atmospheric pressure decreases in hilly and mountainous terrains.

For instance,

Cooking becomes slower and takes more time.

Airplanes flying in the atmosphere are able to operate due to lesser external pressure.

TEMPERATURE:

Temperature is the measure of hotness or coldness on the planet. "

Thermometer:

The device used to measure temperature is a thermometer.

Units:

There are three scales to measure temperature:

1) Celcius Scale:

The Celcius or centigrade is widely used

2) Farenheit Scale:

Farenheit is commonly used in Western world.

3) Kelvin Scale:

The SI unit of measuring temperature is Kelvin Scale but it is not commonly used.

Variations:

There exist certain variations in temperature at different regions. Global warming, or rise in average global temperature is the biggest threat to mankind today.

Humidity:

Humidity is a phenomenon categorized by increased evaporation but lack of rainfall that leads to extreme dry and humid weather conditions.

Coastal Areas:

Generally, coastal areas or countries near the seabelt are humid regions.

The temperature is not too high but lack of breeze or hot waves above the sea make the real feel much higher.

Example:

Karachi, for instance, is a hub to humid weather conditions.

Humid patterns do not witness rainfall or winter-like conditions too often.

Issues:

Humidity can cause negative health effects like breathing issues, claustrophobia or heat strokes.

It is advised to remain hydrated.

(c)

EARTHQUAKE

Definition:

"Earthquake is the sudden outburst of energy, mainly in form of **seismic waves**, due to violent shaking based on underground factors."

Phenomena of Plate Tectonics:

The region below the earth's surface is characterized by rocks and plates. These plates called "**tectonic plates**" are constantly moving and touching rocks at the edges.

Faults:

Over extended time, pressure builds and faults emerge between rocks and plates. They crack and sudden release of energy happens.

Focus:

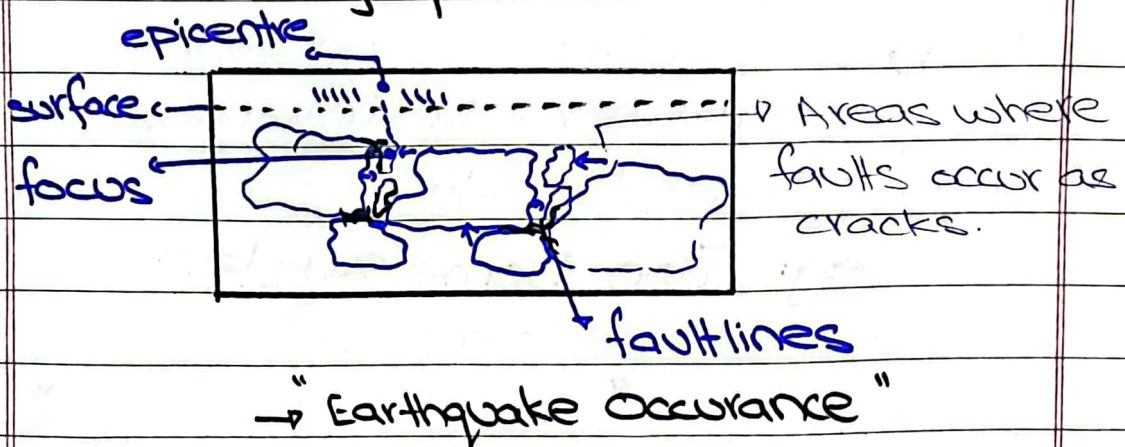
The point of generation of faults is called focus point of an earthquake.

Epicentre:

The point directly above the focus on the earth's surface is called epicentre.

Measurement:

An earthquake is measured on the **Richter Scale** and readings are displayed as a **seismograph**.



(d)

RADAR

Definition:

Radars are inception/sensor devices to detect certain waves, mainly radiowaves or electric waves.

Uses:

Radar technology has extensive applications in diverse

fields:

1) **Speed Checks:** Cameras use radars to monitor traffic speeds.

2) **Remote Sensing:**

Radars are used in remote sensing to analyse the demographic and geographic realities of target of interest.

3) **Defense & Missile Detection:**

Advanced radars are used in the defense industry to intercept drones, missiles etc.

eg: Iron Dome System has equipped world class radar technology.

→ The new "Stealth Technology" remains undetectable by Radars.

4) **Alarms & Electronic:**

Certain electrical equipments use radars to signal interception for bells.

5) **GPS:**

Radars are used to trace locations via GPS.



QUESTION: 4

(a)

SOLAR SYSTEM

Definition:

"Solar System is a large system of Planets in our galaxy which revolve around the Sun."

Planets:

There are **8** planets in the solar system:

- 1- Mars
- 2- Venus
- 3- Earth
- 4- Mercury
- 5- Jupiter
- 6- Saturn
- 7- Uranus
- 8- Neptune

All these planets with exception of Uranus revolve around Sun in a clock-wise direction.

Jupiter is the largest while Venus is the smallest planet.

Dwarf Planet:

There used to be another

planet called "Pluto" but it was declared a Dwarf planet in 2005 due to its small size.

SUN:

Sun is an essential star that is part of the solar system.

Gravity of Sun:

The gravity of the sun is extremely high due to which it keeps these eight planets revolving around it. $(2 \times 10^{30} \text{ ms}^{-2})$

The sun is the major source of light and energy on the earth.

The solar system results in phenomenon of day and night.

In lieu of Big Bang Theory of Expansion, the universe and so, the solar system is expanding.

(b)

PITUITARY GLAND

Pituitary Gland is the largest gland in the body. It produces hormones involved in various functions:

- **Adrenal Cortex:**

This hormone is present on top of kidney and helps in nephron functioning.

- **Thyroid Stimulating Hormone (TSH)**

It is growth hormone in the body. It is involved in various growth related functions.

Excess: Gigantism or abnormal growth of organs.

Deficiency: Dwarfism - smaller height, legs, arms etc.

- **Lactating Hormone (LH):**

Present only in females for lactation purpose.

(c)

RAM	ROM
<ul style="list-style-type: none">• Random Access Memory	<ul style="list-style-type: none">• Read Only Memory
<ul style="list-style-type: none">• Temporarily Stored.	<ul style="list-style-type: none">• Permanently Stored
<ul style="list-style-type: none">• Can be easily altered.	<ul style="list-style-type: none">• Can not be manipulated easily.

USB:

USB is a memory storage device. It is portable and comes in various sizes.

It can be easily damaged due to viruses or corrupt bugs etc.

Motherboard:

Motherboard is the "key" board in software of a computer. It is made up of multiple chips, semi-conduction and intricate wiring.

Data is stored on the motherboard. If it corrupts, the device is non-functional.

(d) " COP-29 Target "

COP-29 recently occurred in November 2024 at Baku. It has been the most controversial COP ever.

NCOG:

The COP has set the New Collective Quantified Goal at **\$300 Billion**. It is a rise from last decades \$100 Billion but the funds are insufficient to halt temperature at 1.5°C rise.

BTRs:

Member countries show non-serious commitment because many did not submit their Biennial Transmission Reports.

NDLS:

The Nationally Determined Limits have been set on convenience so achieving targets is improbable.

USA, Canada and Emissions:

World's second largest carbon producer and leading economy decided to

cut ties with the Climate Agreement. Under such scenario, where no state is ready to cut its carbon emissions, it is very difficult to stop the rising temperature.

This would also result in lesser funds and financial assistance is primary to stop the ever-rising global temperatures.

SECTION-B

ANSWER: 7

(a)

Average:

$$\text{Average} = \frac{\text{sum of values}}{\text{Total number of values}}$$

Let the 1st number be x .

~~Total~~ Acc. to given condition:

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

7

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

$$140 = 7x + 21$$

$$7x = 140 - 21$$

$$7x = 119$$

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

$$k = 17$$

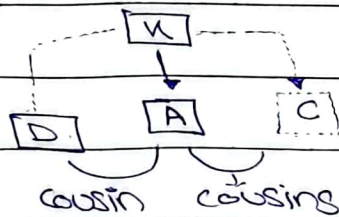
$$\begin{aligned} \text{Largest number} &= k + 6 \\ &= 17 + 6 \\ &= 23. \end{aligned}$$

The largest number is 23.

(b)

Blood Relations

- C is A's father's nephew
- D is A's cousin
- C and D are not brothers
- C and D are related, how?



D and C are cousins.

(c)

i) $4, 18, \underline{72}, 100, 180, 294, 448$

ii) $1, 2, 10, 37, 101, \underline{\quad}$

785
39
46

39
17

128
153

22
46
22
68

iii) 11, 17, 39, 85, 153

+6 +22 +46
60

iv) 13, 24, 46, 90, 178, 354

+11 +22 +44 +68

90
68
158

v) 4, 36, 144, 400, 900, 1764

2² (4) 6² (36) 12² (144) 20² (400) 30² (900)

116
8
128

12
12
24
2x

(d)

Given:

A : B = 1 : 2 (B : C = 3 : 2 , C : D = 3 : 4

A - D = 2240

B = ?

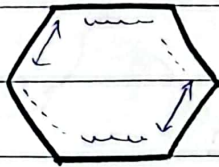
144

Solution:

(c)

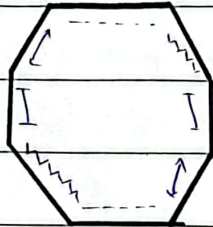
SYMMETRY

Hexagon:



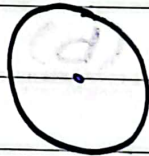
Lines : 3

Octagon:



Lines : 4

Circle:



A circle has no lines of symmetry, it is a closed figure with axis.

(d)

Given:

Length : 7 cm

width : 5 cm

Height : 10 cm

Volume = ?

$$\text{Volume of pyramid} = \frac{1}{3} \times \text{length} \times \text{width} \times \text{height}$$

$$= \frac{1}{3} \times 7 \times 5 \times 10 \text{ cm.}$$

$$= \frac{1}{3} \times 350$$

$$= 116 \text{ cm}^3$$

Volume of the pyramid is 116 cm^3 .



$$\begin{array}{r} 50 \\ 7 \\ \hline 350 \\ \frac{1}{3} \\ \hline 3 \overline{) 350} \\ 300 \\ \hline 50 \\ 42 \\ \hline 80 \\ 70 \\ \hline 10 \\ 9 \\ \hline 1 \end{array}$$

⊙