

## SECTION - II

## ANS # 7

a) let the number be 'x' which is multiplied, so mistaken number is

$$\frac{3}{5}x$$

the original number should be

$$\frac{5}{3}x$$

By definition of percentage error, percentage error should be:

$$\% \text{ error} = \frac{\frac{5}{3}x - \frac{3}{5}x}{\frac{5}{3}x} \times 100$$

$$= \frac{25x - 9x}{25x} \times 100$$

$$= \frac{16}{25} \times 100$$

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$$\% \text{ error} = 64\%$$

b) Ratio of chocolates and ice cream cones in a box is 5:8, let 'i' denotes ice cream cones and 'c' chocolates, then:

$$c : i = 5 : 8$$

number of chocolates 'c' is 30, so:

$$30 : i = 5 : 8$$

$$i = \frac{8}{5} \times 30$$

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$$i = 48$$

So the number of ice cream cones is 48

c) Tablet contains 30mg of medication;

Ms Smith needs 240mg of medication, so tablets needed are

$$\begin{aligned} \text{Number of tablets} &= \frac{240\text{mg}}{\text{measure of medication}} \\ &= \frac{240\text{mg}}{30\text{mg}} \end{aligned}$$

Number of tablets = 8 tablets

d) The average of 50 numbers is 20, So; let number be 'x'

$$\frac{x}{50} = 20$$

The numbers subtracted are 37 and 43, So expression can be written as

$$\frac{x - 37 - 43}{50} = 20$$

$$x = 1000$$

$$\text{Sum of 50 numbers} = x = 1000 - 37 - 43$$

$$\text{Sum of 48 numbers} = x_{48} = 920$$

$$\begin{array}{r} 76.66 \\ 280 \\ \hline 920 \\ \hline 48 \\ \hline 19.16 \end{array} = x_{48}$$

$$x_{48} = 19.16$$

So, the average of 48 numbers is 19.16

## a) I.Q.:

I.Q. is defined as the intelligent quotient of a person.

It has the formula:

$$\text{I.Q.} = \frac{\text{Intelligence in percentile}}{\text{Average of global population}}$$

## Factors that can affect I.Q.:

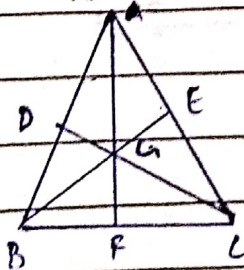
There are several factors that affect I.Q.:

Listing:

- 1) ~~Genetic~~ Hereditary: A person born in certain ethnic and social class possess a similar I.Q.
- 2) Genetic cause: A person born to replicas of helical DNA structure of their parents define his I.Q.
- 3) Nutrition: A balanced diet nutritious maintain I.Q. across ageing; while it diminishes other wise.
- 4) Ageing: Ageing affects I.Q. with increased ageing over 25 years global generally it decreases; where peak times occur between 18-25.
- 5) Physical Activity: With ageing I.Q. can be affected by physical activity. An active person maintains ~~his~~ diminishing I.Q. with exercise and healthy body.

b) The number of triangles in equilateral triangle can be given by:

$$2(n-1) \quad \text{where "n" number of edges}$$



So,

$$2(7-1) = \text{Number of triangles}$$

$$\boxed{\text{Number of triangles} = 12}$$

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c) The concerned word is "Superintendent"

$$\text{Total letters} = 14$$

$$\text{Consonants} = 9$$

$$\text{Vowels} = 5$$

$$\text{Unique consonants} = s, p, r, n, t, n, d, n, t$$

$$= 6$$

$$\text{Unique Vowels} = u, e, i, e, e$$

$$= 3$$

The probability of vowel is

$$= \frac{\text{unique vowels}}{\text{unique consonants}}$$

$$= \frac{3}{6}$$

The probability of vowel	$= \frac{1}{2} = 0.5$
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d) Amount Distributed = Rs. 4320

Share of individuals

$$\text{Aclan's share} = 3 \text{ parts}$$

$$\text{Zain's share} = 2 \text{ parts}$$

$$\text{Ashraf's share} = 7 \text{ parts}$$

So, overall there are  $3+2+7 = 12$  parts

$$\text{single part value} = \frac{4320}{12}$$

$$1\text{-part} = \text{Rs. } 60$$

So, each one is distributed like

Aclan's share	$= 3 \times 60$	$= 180$
Zain's share	$= 2 \times 60$	$= 120$
Ashraf's share	$= 7 \times 60$	$= 420$

# SECTION - I

## ANS# 5

### a) Cyclone's Formation :

Cyclones are named as different according to different geographic locations as Hurricane, Typhoon or Willi willies.. All of them are characterized by low atmospheric pressure at the center of storm. The low pressure at ocean's center attract small drops from surrounding. Thus a strong Coriolis force makes quick condensation to clouds and hence a huge rains occurs as a result. The air is the mid cools fast enough with height to produce moist convection. As a general rules for development tropical pressure will be maintained atleast 500km from equator produce Coriolis for cyclone.

### b) IONIC BONDING

i) The complete sharing of an electron in a bond formation occurs via Ionic Bonding

ii) The transferring atom of electron attains +ve charge with losing  $e^-$  while gained atom attains -ve charge

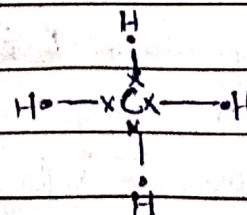
iii) The transfer of electron in NaCl. Na attains +ve while Cl attains -ve charge to forms ions.

### COVALENT BONDING

(i) When an electron shared by a neighbouring atom to another the bond formation happens is a Covalent Bond.

(ii) The electronegativity value is defined in terms of partially +ve charge and partially negative charge

(iii) In methane  $CH_4$ , Hydrogen H atoms attains bonding with 4 C atoms via Covalent Bonding.



## c) Uses of Radiation:

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There are many domestic and industrial applications across vast appliances that Gamma Rays, X-Rays and Radio waves can be used. Some of them are:

### a) Gamma Rays:

Gamma Rays are generally used in research facilities, such as: laboratories, high end plutonium production. Nuclear Industry makes use of Gamma Rays.

### b) X-Rays:

X-Rays more renowned for being called Roentgen Rays are used for medical purposes. ~~to~~ Identifying bone fractures, organ functioning etc. Also used in home appliances as ovens.

### c) Radio Waves:

Radio waves are the backbone of communication industry. Electromagnetic media is composed of different band range frequencies called ~~to~~ EM propagation bands. Examples are 50Hz, 60Hz etc.

## d) Tides:

The currents in ocean defines tides such as easterlies and westerlies on the surface of ocean floor. Resultantly, the waves of longitudinal nature becomes prevalent to direct these tides. Tides remains in constant flow on ocean due to air flow. The idiom "Time and Tide wait for none" is a testament to their behavior.

## L.E.D:

LED is the acronym for Light Emitting Diode. It is widely used in circuitry where its function is mainly characterized for identification. L.E.D is a special type of diode having same 0.7 voltage drop across it that sparks photo reaction is response to voltage drop. LED are also common place in

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vehicles, appliances, gadgets, robotics etc.

## CLIMATE

(i) Climate is characterized by mean average global temperature across several years.

(ii) Climate is defined for a huge area as a mean of global average across several years.

(iii) Global climate crisis are prevalent across centuries that is also a reason to Evolutionism.

## ENVIRONMENT

(i) Environment is basically composed of air composition in our surrounding, comprising  $O_2$ ,  $N_2$  as major constituents and also poisonous gases.

(ii) It is defined for a short geographical vicinity, such as few kms.

(iii) Environment doesn't define any such phenomena.

### Causes of Air Pollution in Pakistan:

In Pakistan there are several reasons that contribute to air pollution, some are listed below:

(i) Traffic: An irregular traffic characterized by old and carbon producing vehicles.

(ii) Industrial Waste: Apart from chemical wastes, there is a lack of check on industries for compliant emission of poisonous substances such as Chlorofluoro carbons.

(iii) General Negligence: People at large are not compliant to feed their trash to garbage facilities. Rotten organic waste disturbs aura of air.

(iv) Fertilizers: Our irrigation is widely characterized by fertilizer disregarding modern irrigation technologies. These fertilizer ends up making phosphatic compounds in air.

(v) Fossil Fuels: Pakistan needs a serious shift from its coal based power to renewables because carbon end up making air

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(vi) Cosmetic: The cosmetic contains CFCs that are devastating to air pollution and is the major component of air pollution.

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## b) Vitamins :

Vitamins are the general constituent of a balanced diet that accounts for good functioning of our body. It reduces inflammation and composes a healthy body.

### Vitamin A :

It is an essential vitamin for good eye health. Deficiency creates Night blindness :

### Vitamin B :

It is a complex of vitamins such as Riboflavin, Tocopherol

### Vitamin C :

Vitamin C is soluble vitamins. Generally secreted in fruit juices.

**Vitamin D :** Vitamin secreted in sunlight, not produced by body.  
Essential for healthy bones

### Vitamin E :

It is secreted in leafy vegetables. Deficiency creates Rickets (porous teeth)

### Vitamin K :

Its deficiency creates beri-beri (a problem characterized on softness of bones).

Hence, all vitamins are either soluble or insoluble in a body. Some are secreted inside body or injected via food intake or environment. Their deficiency creates plethora of problems.



**CJ COP 27****COP 28**

i) Characterized to pursue Paris Climate Accord of 2015 and leave global average rise to pre-industrial average of  $1.5^{\circ}\text{C}$

ii) The same is pursued by UAE to limit emissions by 2050 well below  $1.5^{\circ}\text{C}$  under UNFCCC.

iii) All three agendas of mitigation, adaptation and climate financing were discussed in Egypt. For financing Egypt was concerned for \$125 billion debt by 2047.

iii) The direction is not clear for now as COP28 is in early phase of drafting.

**Active Sensors:**

The active sensors in CIS (Global Information System) is characterized by objects creating and emitting their own energy to make use of data via CIS constituents (hardware, software, data management)

Use in CIS:

Active sensors such as RADAR and LIDAR radiates their energy. This is then was carried by signals to get signal from nearby object with this energy. Via EM media the energy is reflected back to CIS control system.

**Passive Sensors:**

Passive sensors in CIS are characterized to not emit their energy. They relies on natural energy sources such as Sunlight and Electrical pulses from other devices

Use in CIS:

Carving out cartography on a map is important CIS application achieved via Photography where images were formed by the help

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of energy from sunlight.

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