

## SECTION - II

QUESTION : 06

a)

Data:

$$\text{Sum of 3-digit number} = 15$$

$$\text{Sum of 10th and unit digit} = 12$$

$$\text{Diff of unit digit from 10th} = 2$$

$$\text{Three digit number is} = ?$$

Solution:

Let the digit be  $xyz$ 

Now,

$$x + y + z = 15 \quad \text{--- (i)}$$

While,

$$x + z = 12 \quad \text{--- (ii)}$$

and,

$$x - z = 2 \quad \text{--- (iii)}$$

Solving (ii) and (iii) simultaneously,

$$x + z = 12$$

$$x - z = 2 \quad (\text{change of signs})$$

$$2z = 10$$

$$z = 5 \rightarrow \text{A}$$

Putting (A) in (ii),

$$x + z = 12$$

$$x + 5 = 12 \Rightarrow x = 12 - 5$$

$$x = 7 \rightarrow \text{B}$$

Putting (A) and (B) in (i),

$$x + y + z = 15$$

$$7 + y + 5 = 15$$

$$y = 3 \rightarrow \text{C}$$

So, the three digit number is,

$$= \boxed{735}$$

In  $x \underline{\quad} y \underline{\quad} z$

(B)

Data:

Small, medium, large size pizza = 18 persons.

One slice per person = 18 slices.

Slices ratio w.r.t pizza size = 2:3:4

One slice weigh = 40gm

Price of small pizza = Rs. 320

Price and weight of total pizzas = ?

Solution:

Finding the number of slices first,

Provided ratio is, 2:3:4 So,

Total slices needs to be = 18

Now,

$$2 + 3 + 4 = 9$$

$$\text{Small: } \frac{2}{9} \times 18 \Rightarrow \boxed{4 \text{ slices}}$$

$$\text{Medium: } \frac{3}{9} \times 18 \Rightarrow \boxed{6 \text{ slices}}$$

$$\text{Large: } \frac{4}{9} \times 18 \Rightarrow \boxed{8 \text{ slices}}$$

Using number of slices to find the cost of each pizza,

If 4 slices, small pizza, cost Rs. 320 then,

Slices: Price

$$4 : 320$$

$$6 : x$$

$$320 \times 6 = 4 \times x$$

$$1920 = 4x$$

$$x = \frac{1920}{4}$$

$$\boxed{x = 480 \text{ Rs}} \text{ (Medium)}$$



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Using same method,

Slices: Price

$$4 : 320$$

$$8 : x$$

$$320 \times 8 = 4 \times x$$

$$2560 = 4x$$

$$x = \frac{2560}{4}$$

$$x = 640 \text{ Rs (Large)}$$

Now, finding weight of each,

$$1 \text{ slice weight} = 40g$$

So,

$$\text{Small: } 4 \times 40$$

$$160g$$

$$\text{Medium: } 6 \times 40$$

$$240g$$

$$\text{Large: } 8 \times 40$$

$$320g$$

Finally, we know.

$$\text{Price of small pizza} = \text{Rs. } 320$$

$$\text{" " medium " } = \text{Rs. } 480$$

$$\text{" " Large " } = \text{Rs. } 640$$

$$\text{Weight of small pizza} = 160g$$

$$\text{" " medium " } = 240g$$

$$\text{" " large " } = 320g$$

X ————— X

(c)

Data:

Diameter of Circle = 6 cm

Circumference of Circle = ?

Area of Circle = ?

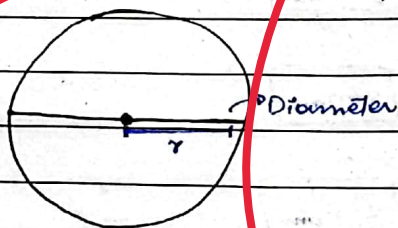
Solution:

We know that for circumference and area, radius is required, and radius is half of the diameter. So,

$$\text{Radius} = \text{Diameter} / 2$$

$$r = \frac{6}{2}$$

$$r = 3 \text{ cm}$$



For Area,

$$= \pi r^2 \quad (\text{where } \pi = 3.14)$$

$$= \pi (3)^2$$

$$= 9\pi \quad \text{OR}$$

$$= 28.3 \text{ cm}^2$$

For Circumference,

$$= 2\pi r$$

$$= 2\pi (3)$$

$$= 6\pi \quad \text{OR}$$

$$= 18.8 \text{ cm}$$

X ————— X



d.

(i) 13, 24, 46, 90, 178, \_\_\_\_\_

Solution:

: Considering the series,

13, 24, 46 ...

- Each number is close to the precedent twice but subtract by two.

Now,

 $(\text{Precedent} \times 2) - 2$  (series on  $\frac{1}{2}$ )

Proving,

$$13 \times 2 = 26$$

$$26 - 2 = 24$$

Likewise,

$$178 \times 2 = 356$$

$$356 - 2 = 354$$

Hence,

the answer is 354 ✓

(ii) 5, 6, 9, 14, 21, \_\_\_\_\_

Solution:

Considering the series, 5, 6, 9...

- There is a difference of prime numbers among each number,

Proving, 
$$\begin{array}{ccccccccc} 5, & 6, & 9, & 14, & 21, & & & & \\ \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & \underbrace{\quad} & & & & \\ 1 & 3 & 5 & 7 & 11 & (\text{next prime no.}) & & & \end{array}$$

So,

$$5, 6, 9, 14, 21, (21+11)$$

$$5, 6, 9, 14, 21, 32$$

Hence,

the answer is 32 ✓

QUESTION: 08

a)

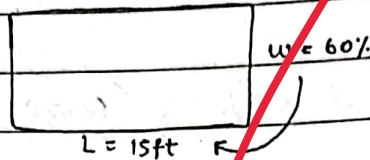
Data:

Width of Rectangular Room = 60% of length

Length of Classroom = 15 ft

Room's dimensions = ?

Solution:



finding 60% of 15 feet

$$\frac{60}{100} \times 15 \Rightarrow \frac{90}{10}$$

$$W = 9 \text{ ft}$$

Room's dimensions are,

$$L, W = 15, 9 \text{ ft}$$

$$\text{Area, } 15 \times 9 \Rightarrow 135 \text{ ft}^2$$

b)

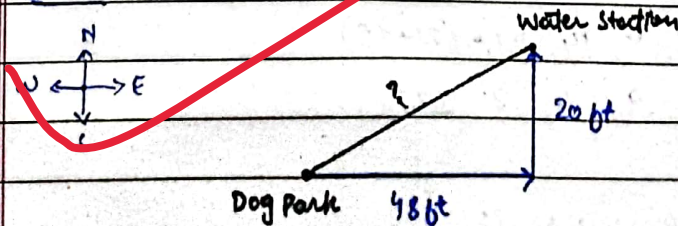
Data:

Veena ran: 48 ft - East

Turned Left: 20 ft - North

Displacement between origin and destination = ?

Solution:





Applying Hypotenuse formula,

$$H^2 = P^2 + B^2$$

$$H^2 = (20)^2 + (48)^2$$

$$H^2 = 400 + 2304$$

$$\sqrt{H^2} = \sqrt{2704}$$

$$H = 52 \text{ feet}$$

It would be 52 feet walk for Veena if she went directly from dog park to water station.

X ——— X

(C)

Data:

Aug. marks of 40 students = 52.15

One student's marks misinputed as 49 instead of 85.

New Aug. of class = ?

Solution:

We know Aug. formula,

$$\text{Average} = \frac{\sum x}{\text{no. of terms}}, \text{ we are given}$$

$$52.15 = \frac{\sum x}{40}$$

$$\sum x = 2086 \text{ (total sum)} \rightarrow (i)$$

Now, calculating one misinputed marks,

$$= 85 - 49$$

$$= 36 \rightarrow (ii)$$

Add (ii) in (i) because marks of students increased,

$$\sum x = 2086 + 36$$

$$\sum x = 2122 \text{ (new sum)}$$

New Aug,

$$\text{Aug.} = \frac{2122}{40}$$

$$= 53.05$$

(d)

Data:

Vegetable pizza liked by = 37

Chicken " " " = 25

People like neither = 3

Probability of chicken Pizza = ?

Solution:

Calculating total Probability

$$V + C + N = 37 + 25 + 3$$

$$= 65$$

- If a person is asked randomly;  
Probability of person likes chicken pizza is,

$$= \frac{25}{65}$$

$$= \frac{5}{13} \text{ OR } 0.384$$

$$= \boxed{38.4\%} \text{ probability is}$$

X ————— X



SECTION - IQUESTION : 03

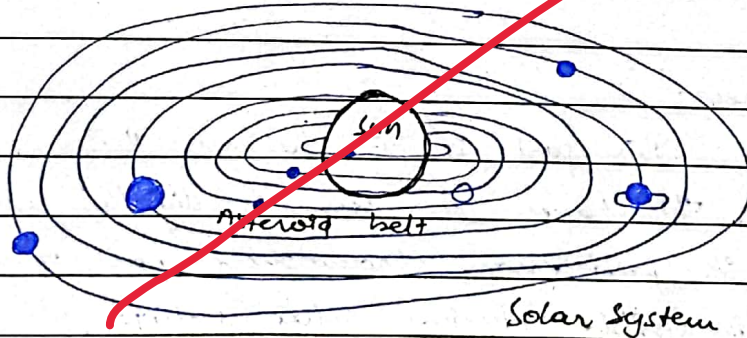
(A)

1. SUN

The lone star of our solar system is sun. Its astronomical name is Helio. Sun is in the middle of our solar system, and all the planets revolve around it.

2. FACTS about Sun:

- Sun also rotates around its own axis.
- Sun ~~rotates~~ revolves around the milkyway galaxy
- It take 22 million years for sun to cover one revolution. Last Helio year was in Sept, 2016.
- Sun influence the waves on Earth more than the moon does.
- Sun is a yellow dwarf that ~~will~~ not go supernova, but will become a white dwarf.

3. SUN'S STRUCTURE

It can be divided as

- |                      |                 |
|----------------------|-----------------|
| i) Core              | iv) Photosphere |
| ii) Radiative zone   | v) Chromosphere |
| iii) Convection zone | vi) Corona      |

DAY \_\_\_\_\_

i)

CORE:

core can be divided as inner and outer core. Its temperature is in millions of degree Celsius.

ii)

Radioactive zone:

Sun is made-up of hydrogen and helium mostly. These gases are also responsible for the nuclear fusion on sun. This process is done in this zone.

iii)

Convection zone:

This region contains a lot of molten lava or magma. Convectional current revolves this magma inside, making sun to burn.

iv)

Photosphere:

This region is 500km thick with high temperature. Sun spots are happened because of this region. This is visible part of the sun as well.

v)

Chromosphere:

This part is just above the photosphere. This layer of sun is slightly less hot than its predecessor. Chromosphere part of the sun is visible during solar eclipse.

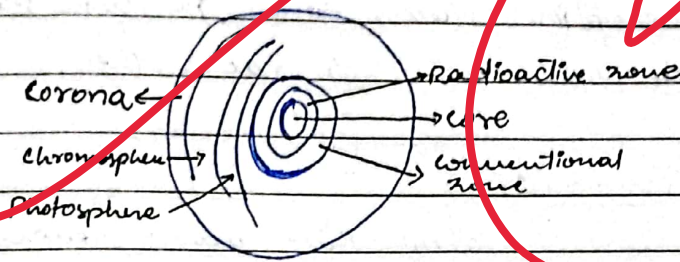
vi)

Corona:

It is the outermost part of the sun. This layer forms the ring around the sun during total solar eclipse. Corona has temperature



up to 2 million degree Celsius. Solar winds are the product of this region.



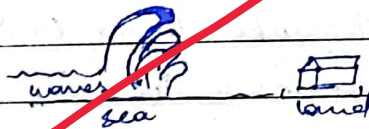
Structure of Sun.



b)

1. TSUNAMI

It is a natural phenomenon, where large tidal waves form in the ocean or seas. It is normally common in deep oceans such as Pacific. If tsunami reaches land then it causes havoc.

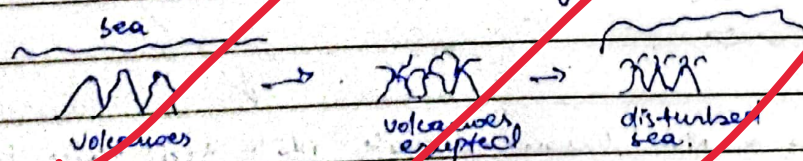


2. GENERATION OF TSUNAMI

i) Movement in plates of Earth:

Earth is

made up of seven major tectonic plates. The movement in these plates impact the sea bed as well, resulting in seven-story height waves. This can be caused by volcanic eruption.





ii) Forming of waves:

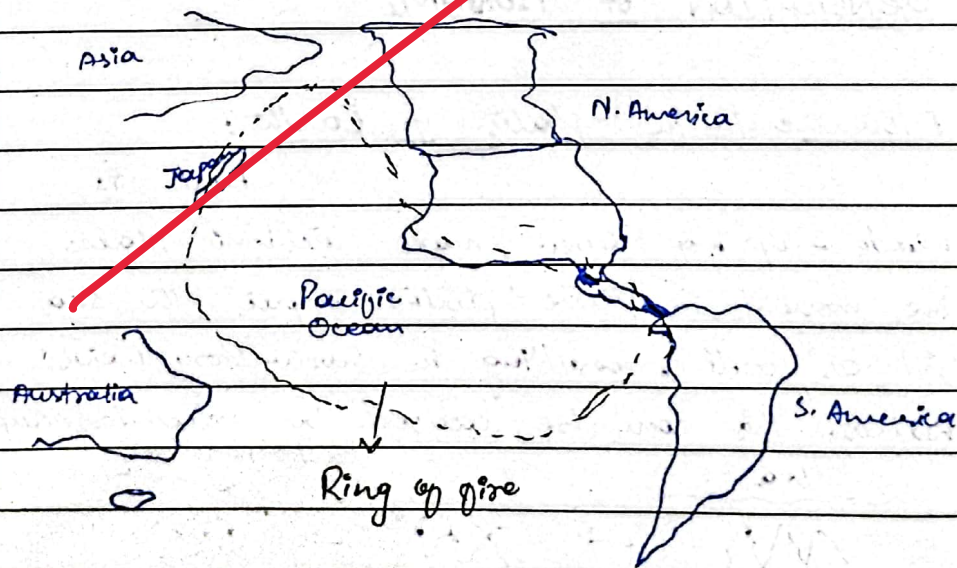
The kinetic energy of volcanic eruption takes form in high sea-tides. These tides rush into each other.

iii) Form of Tsunami:

When these waves reach shallow water they form much higher waves with speed upto 30 km/h. This can bring-up marine life with it as well.

3. Example:

- The most recent Tsunami is in 2022. It erupted because Hunga-Tunga volcano exploded in Pacific Ocean.
- Other than that on March 11, 2011 Tsunami in Japan caused destruction. It was caused by under water Earthquake lasted 6 minutes. 19000 people died because of it.



- Ring of fire: Merger of major plate tectonics hence, chances of Tsunami.



(C)

## 1. ENVIRONMENTAL POLLUTION

According to UN environmental protection (UNEP), it is the contamination of environment by pollutant in any form, & called environmental pollution. Environmental pollution is common in recent times as the land, water and air, all are polluted by different pollutants.

## 2. TYPES OF ENVIRONMENTAL POLLUTION

### (i) LAND POLLUTION:

The contamination of soil by different pollutants is called land pollution. It degrades the soil and poses threat to vegetation and even ground water.

#### a) Causes:

- i) Sewage pipes leakage.
- ii) Canal water leakage.
- iii) Excess fertilizers or pesticides.
- iv) Deposition of solid waste.
- v) Industrial waste.

#### b) Effect:

- i) Degradation of soil
- ii) Water logging
- iii) Making agricultural land barren
- iv) Pollutants in land hurting microbial life
- v) Contamination of ground water.

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c) Measures to be taken:

- i) Sewerage pipes be checked.
- ii) Land-bills for solid waste and industrial.
- iii) Heavy fine on violation.
- iv) Land-conservation programs
- v) Awareness among farmers.

ii) Water Pollution:

The contamination of water bodies due to the pollutants. It is responsible for many human deaths.

a) Causes:

- i. Sewerage water.
- ii. Eutrophication
- iii. Industrial waste.
- iv. Domestic waste.

b) Effect:

- i. Diseases due to lack of potable water.
- ii. Death of fishes and marine life.
- iii. The aesthetic is affected.

c) Solutions:

- i) Ban on excess use of pesticides and fertilizers.
- ii) Solid waste management.
- iii) Treatment of sewerage water.



iii)

Air Pollution:

The contamination of air by pollutants that mix in air. More than 50,000 people died indirectly because of air pollution in USA as per UNEP.

a) Causes:

- i. Industries in cities
- ii. Transport sector
- iii. Burning of plants

b) Effect:

- i. Asthma and relevant diseases
- ii. Reduces life-span.
- iii. Makes this vision opaque i.e. smog.

c) Solutions:

- i) Relocation of industries
- ii) Ban on private transport and promote public transport
- iii) Training of farmers.
- iv) Global cooperation to deal with the challenge, for instance, through COP.

x ————>

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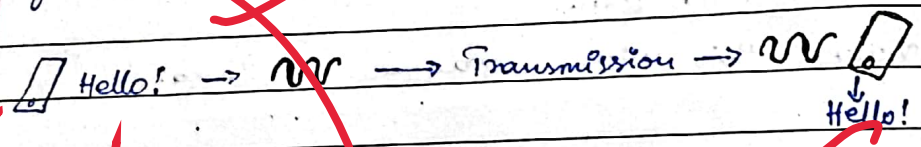
d)

# 1. WIRELESS COMMUNICATION:

Wireless communication came with the arrival of internet. It enables a person to convey a message to a person sitting at the other side of the globe without any wired-communication.

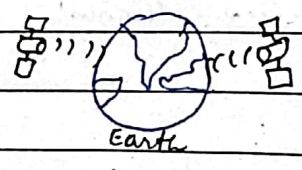
2. METHOD:

Electromagnetic waves such as radio wave is used in it. The voice or text message is converted into electromagnetic signal that is decoded at receiver's end.



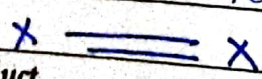
3. SATELLITE:

Satellites are used for wireless communication as well. These satellites can send, receive, transmit information in a blink of an eye.



3.1 Working of a Satellite:

Satellites share radio signals with specific frequency to convey the information. 24 satellites revolves around the Earth for communication. They share data with human's electronic devices for effective communication in real-time.





QUESTION: 05

a)

1. CELL:

A cell is a basic building block of any living thing. It contains genetic or species DNA and other information. Cells combine to form tissues.

1.1 Eukaryotic cell:

These cells are in plants. They have a cell membrane too that distinguishes them.

1.2 Prokaryotic cell:

These cells are in animals. They do not have cell membrane. They can move too unlike Eukaryotic cells.

X ——— X

b)

1. GLOBAL WARMING

The average increase in Earth's atmosphere of temperature is called global warming. Since 1840s, humans are close to achieve 1.5°C hallmark increase of temperature globally.

2. EFFECT:

i) Biodiversity loss e.g. 1/4 mammals at the verge of extinction.

ii) Extended summers cause less time for winter crops.

DAY \_\_\_\_\_

iii)

Rising sea levels because of glacier melting.

iv)

Affect on human health.

### 3. KYOTO PROTOCOL

The main proponent of global warming is Greenhouse gases (GHG). To counter it, Kyoto Protocol was signed in 1997. It is in force since 2005.

#### 3.1 Purpose:

It aims to curb the GHG emission by all means. Therefore, worldwide ban was imposed on GHG including CO<sub>2</sub>, sulphur and other.

#### 3.2 Impact:

The overall carbon emission, despite conflicts, has been slowed down. According to one study, 20% carbon emission is reduced due to this protocol.

X ——— X

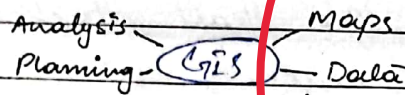


## Q1. GIS

It stands for Geographic Information System (GIS). This system is used by computers to display maps usually. It helps in building resilient urban planning as well.

## 2. Working

It takes help from satellites, phone applications and human-made structures. Then, GIS analyses data to provide results one wants.



## 3. APPLICATIONS

- i. Urban Planning.
- ii. Emergency response.
- iii. Flood forecasting.
- iv. Transportation planning.
- v. Data Management.

X = = X

d)

1.

ANTIOXIDANTS

There are the protectors of cells that preserve cells through their free radicals. They can be natural or man-made.

• SOURCE:

Fruits and vegetables.

2.

SIGNIFICANCE

i.

Prevent diseases like Heart attack and certain types of cancer.

ii.

Prevent acceleration of age. (uncontrollably)

iii.

Preserve nerve and other cells.

iv.

Protect eyes as well.

- Include diagrams in each questions

- Use clear and concise language

- Provide detailed explanations and examples

- Double-check calculations for accuracy

- Organize answers with headings and subheadings