

# SECTION - I

## General Instructions

QUESTION NO: 04

1. Give numbering to headings
2. Do not write lengthy paragraphs. Write medium sized paragraphs with headings.

3. Do not use table for comparison and contrast questions.

4. Draw figures/diagram/flowchart where needed.

5. Start new question from fresh page.

6. Write unit of the answer in ability section.

7. Explain mathematical steps and the reasoning for better score.

8. Change colour scheme for references to give them more visibility.

9. Manage time well.

10. Wide page borders are discouraged.

11. Avoid writing wrong references.

12. Give more weightage to expressly asked part/s of the question.

a) Solid Waste

Human produce vast quantities of solid waste at home, factories, schools and other areas. The waste is sent to land fill which depletes the soil.

Use toxic fertilizers and pesticides to reduce insects, fungi and bacteria.

b) Minining Activities

For surface minning removal of top soil requires which is fertile layer of soil and organic matter to get valuable rocks below. Removal of topsoil cause pollution.

c) Urbanization and Industrialization

To fulfil demand of growing population regarding food shelter more production is done by industries which creates more wastes and for the shelter and industries development is done.

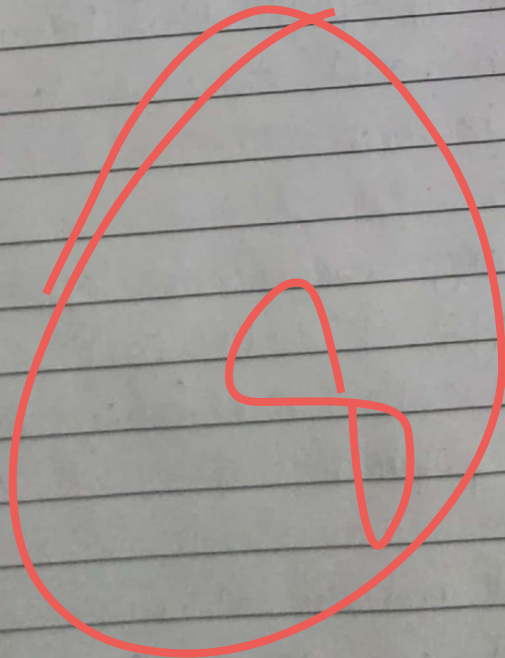


### e) Chemicals and Nuclear Waste

In nuclear fission and fusion huge amount of energy is produced. Radioactive material contains heavy metals and toxic chemicals that can affect human health, and these are dumped in soil which creates land pollution.

### f) Land Conversion

It means alteration and modification of land properties which reduce the fertility of land and creates land pollution.





b) **Main Goals of COP27**  
 COP27 was held on 6-18 November at Sharm El Sheikh Egypt. Various countries of world took part in its presidency to convert lectures and define priorities. The following are the key goals of COP27

i) **Mitigation** All the leading countries of world are urged to take immediate actions to emission of Green house gases and to control the global warming.

ii) **Adaptation**: In COP27, countries should adapt strategies to enhance climate change resilience and assist the world's most vulnerable communities.

iii) **Finance**: <sup>Developed</sup> Countries should provide climate finance to support developing countries which are mostly hit by global warming. and promised \$ 100 billion to support mostly hit countries.

iv) **Adaptation: Collaboration** As per the consensus of UN, equal participation of all stakeholders is needed.

c) **Role of GIS in Environmental Science**

It play key role in Environmental Science.

i) **Monitor Environmental Risk**

Geographic Information Systems monitor the risk of environment such as weather forecast

ii) **Modeling Storm Water runoff**

It creates model to support storm water



Detail needed

- iii) Management of watersheds, flood plains  
It provide proper planning method to manage flood plains wetlands, forest, aquifers.
- iv) Ground water modeling and contamination tracking.

It track the level of ground water and how it can be decreased or increased through tracking.

## a) Fundamentals of Artificial Intelligence

In computer science and field of computers the word "AI" has played a very prominent role and this term is getting much more popularity due to recent developments in the field of "Artificial Intelligence".

### i) ~~AI~~ Problem Solving

Artificial Intelligence had made the task to be solved easily. All are being looked upon as tools and techniques to improve the world.

### ii) Reduced Human Efforts

AI work in auto-mated fashion which had reduced the human efforts to complete the work. It has reduced manual work in automation.

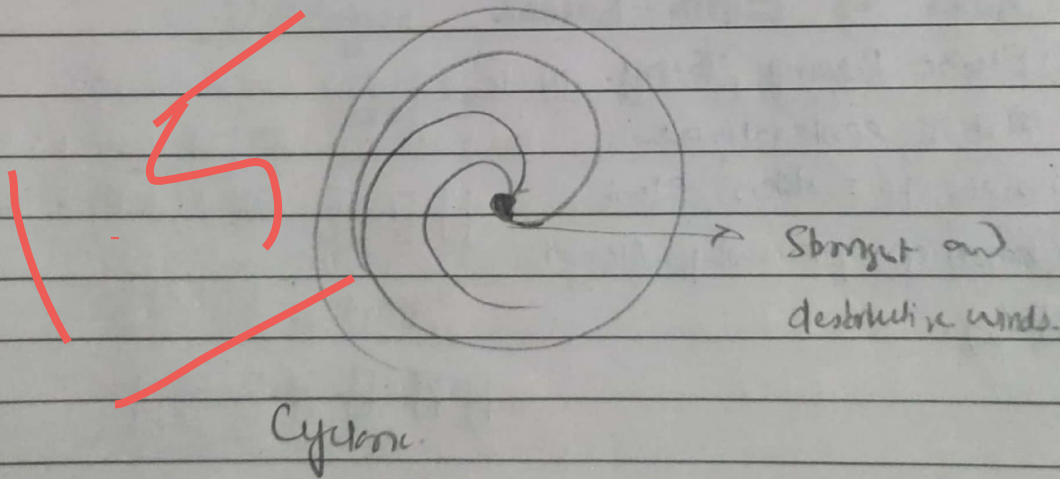
### iii) Accuracy

AI tend to speed up your task and processes with guaranteed precision and accuracy. It had made error-free with their simple and everyday techniques.

QUESTION: 03Ans4) CAUSE of Cyclone

There are various factors which are responsible for the formation of cyclone. Such as warm temperature at sea level. Coriolis force deflects the air that forms a low pressure zone. Atmospheric instability, increased humidity in the lower to middle levels of troposphere, low vertical wind shear and pre-existing low-level disturbance or focus.

Moreover the strongest and destructive winds in a northern hemisphere tropical cyclone is located in the eyewall and the right front quadrant.





b)

## Shallow focus and Deep Focus

### Shallow Focus

Most parts of world experience shallow focus earthquakes. These are originated within 60 km (40 miles) of earth's surface. The great majority of earthquakes focus are shallow. The geographic distribution of smaller earthquakes is less completely determined than more severe quakes.

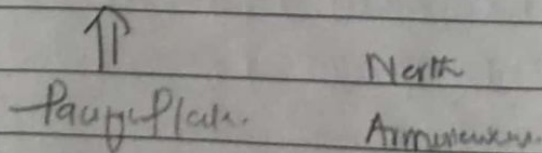
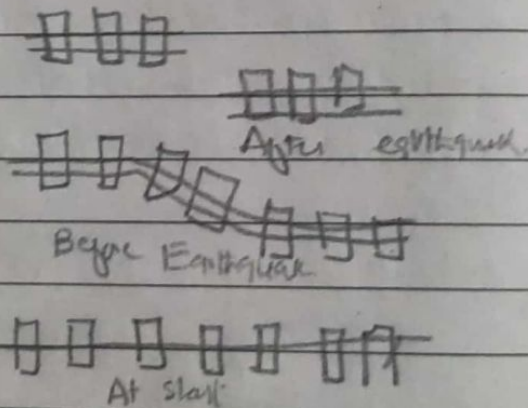
### Deep Focus

The deeper focus earthquakes commonly occur in pattern called Benioff Zones that dip into earth indicating the presence of a subducting slab. Benioff zones coincide with tectonically active island arcs such as Japan, Vanuatu, Tonga and the Aleutians.

## Cause of Earth - Quake

### i) Elastic Rebound Theory.

Most of earthquakes are result of sudden elastic rebound of previously stored energy.



### ii) Plate Tectonics

Crust of earth is not uniform sheet. It's made up of huge blocks that fit together. These blocks are called tectonic plates.



Tectonic plates have created weak points which is called faults. Most faults occur along the boundaries of tectonic plates and these are zones where earth quake occur.

### iii) Volcanic Activities

They can cause earthquake as magma rises within a volcanic chamber. magma pushes apart the plate which causes earthquakes.

### iv) Other causes

It includes land sliding, emitting of water vapors under high pressure, atomic bomb explosion etc.

→ The worst in Morocco's recent history was 6.8 magnitude earthquake that killed

## c) Dengue Fever

Dengue fever is debilitating mosquito-borne disease caused by one of five closely related dengue viruses. This disease is endemic in more than 100 countries and infects 50-100 million individuals annually.

### Causes of Dengue Fever

Dengue fever is caused by any one of 4 types of dengue virus. Dengue fever is primarily caused by mosquito bites. The two types of mosquitoes that most often spread the dengue virus are common both in and around human habitats.



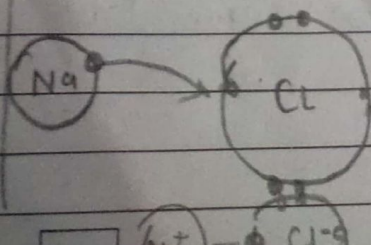
Prevention measures to avoid Dengue fever

- 1) Stay away from heavily populated residential areas
- 2) Use mosquito repellents even indoors.
- 3) Wear long sleeves in outdoors
- 4) Secure window and door screens and free of holes. Use mosquito nets.

4) Distinguish ionic and covalent bond with examples

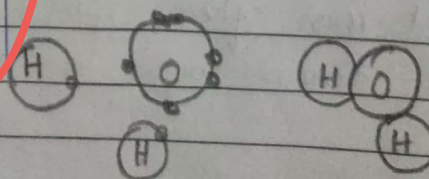
### Ionic Bond

- i) The transfer of two electrons between two atoms having different electronegativity forms this bond.
- ii) This is a strong bond due to electrostatic forces of attraction.
- iii) It is formed between metal + non-metal.
- iv) This bond makes substance hard and brittle.



### Covalent Bond

- i) This type of bond is formed by the mutual sharing of electrons between same or different elements.
- ii) This is also fairly strong bond because the electron pair is strongly attracted by nuclei.
- iii) It is formed between non-metal atoms.
- iv) This bond makes substance hard and incompressible.





Q No: 06

Ans

a)

$$i) \quad 10, 100, 200, 310, \underline{430}$$

$$+90 \quad +100 \quad +110 \quad +120$$

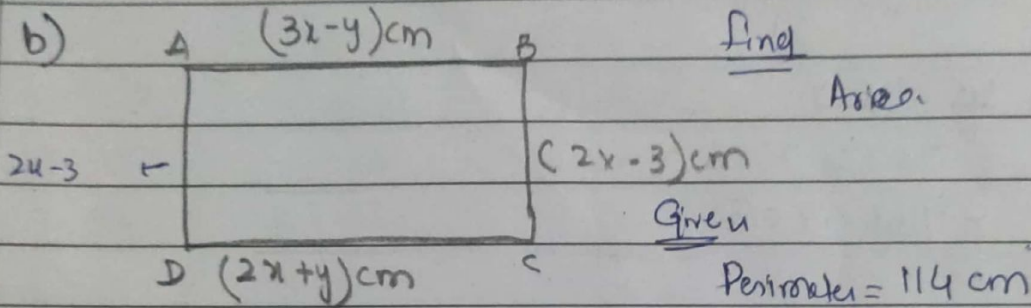
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$$ii) \quad 3, 7, 23, 95, 479$$

$$(3 \times 2) + 1 \quad (7 \times 3) + 1 \quad (23 \times 4) + 3 = 95$$

$$(95 \times 5) + 4$$

Explain the reasoning in sentences.



First equate the both length because <sup>both</sup> length of Rectangle must be equal.

$$|AB| = |DC|$$

$$3x - y = 2x + y$$

$$3x - 2x = y + y$$

$$x = 2y$$

$$\text{Perimeter} = |AB| + |DC| + |BC| + |AD|$$

$$= 3x - y + 2x + y + 2x - 3 + 2x - 3$$

$$= 9x - 6 \quad (\text{Perimeter})$$

$$9x - 6 = 114$$

$$9x = 114 + 6$$

$$x = \frac{120}{9} = x = 13.33$$

$$x = 2y$$

$$13.33 = 2y = 6.66$$

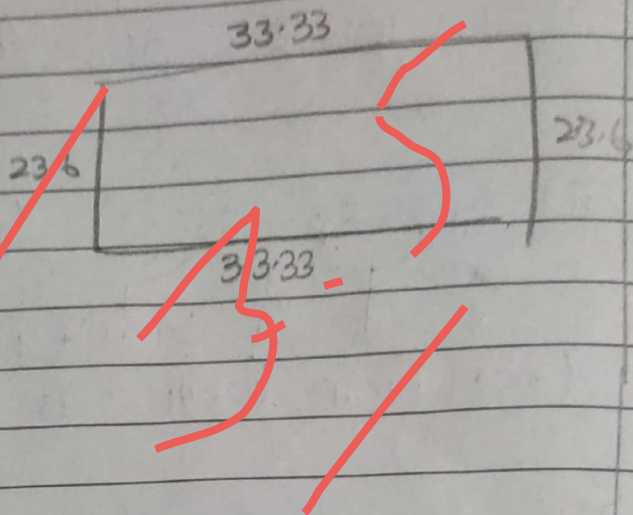


Now convert length and width in digital form

$$\begin{aligned} |AB| &= 3x - y \\ &= 3(13.33) - 6.66 \\ &= 33.33 \end{aligned}$$

$$\begin{aligned} |CD| &= 2x + y \\ &= 2(13.3) + 6 \\ &= 33.33 \end{aligned}$$

$$\begin{aligned} |AD| &= 2x - 3 \\ &= 2(13.3) - 3 \\ &= 23.66 \text{ cm} \end{aligned}$$



Area is  $L \times W$

$$\begin{aligned} &33.33 \times 23.6 \\ &= 788.58 \text{ cm}^2 \end{aligned}$$

c) Given

Nisha = 15 years + age of Rumi  
5 years ago

Nisha = 3 x Rumi's age  
( $x + 15 - 5$ )

Find

Nisha's present age = ?

Let  $x$  be Rumi's age.

Solution Rumi's age ( $x - 5$ )

Current 5 years ago

$$\begin{aligned} \text{Nisha's age} &= 15 + x - 5 \\ &= x + 10 \end{aligned}$$

as Nisha's was 3 x Rumi's age.

$$x + 10 = 3(x - 5)$$

$$x + 10 = 3x - 15$$

$$15 + 10 = 3x - x$$

$$\begin{aligned} 2x &= 25 \\ x &= \frac{25}{2} = 12.5 \end{aligned}$$

$$\text{Rumi's age} = 12.5$$

$$\text{Nisha's age} = x + 15$$

$$= 12.5 + 15$$

$$\text{Nisha's age} = 27.5 \text{ years}$$



d)

Given

$$\text{Oranu} = 210$$

$$\text{Apple} = 252$$

$$\text{Pears} = 294$$

Find

↳ Biggest possible number of cartons needed to pack the fruits.

It can be calculated by using HCF

210

$$\begin{array}{r|l} 2 & 210 \\ \hline 3 & 105 \\ \hline 5 & 35 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

252

$$\begin{array}{r|l} 2 & 252 \\ \hline 2 & 126 \\ \hline 3 & 63 \\ \hline 3 & 21 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

294

$$\begin{array}{r|l} 2 & 294 \\ \hline 3 & 147 \\ \hline 7 & 49 \\ \hline 7 & 7 \\ \hline & 1 \end{array}$$

$$2 \times 3 \times 5$$

$$2 \times 2 \times 3 \times 3 \times 7$$

$$2 \times 3 \times 7 \times 7$$

$$2 \times 3 \times 7 = 42 \text{ Nos.}$$



QNO: 7

Ans:

a)

Given

$$20\% = ₹ 80$$

$$100\% = x \text{ ? (Find)}$$

Cross multiplication

$$20\% \times x = 80$$

$$100\% \times 80 = x$$

$$20\% \times x = 80 \times 100\%$$

~~let~~ multiply

$$0.20 \times x = 80 \times 1$$

~~let~~

$$x = \frac{80}{0.2} = 400$$

Original price of shirt is Rs 100.

Given

b) BROTHER is QDQSNQA

Find SISTER?

B R O T H E R

+14 +11 +17 +1 +5 +11 +8

1	2	3	4	5	6	7	8
A	B	C	D	E	F	G	H
9	10	11	12	13	14	15	16
I	J	K	L	M	N	O	P
17	18	19	20	21	22	23	24
Q	R	S	T	U	V	W	X
25	26						
Y	Z						

S I S T E R, is

+14 +11 +17 +1 +5 +11

G U K S K A



D)

Given

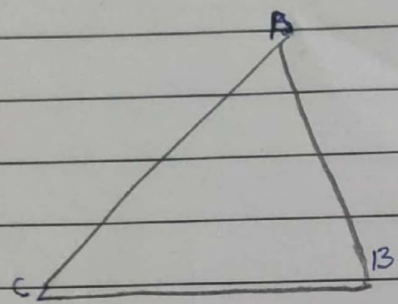
Pizza is  $\frac{8}{8}$  pieces

Raisin slices = 3

Probability of slice with raisins is  $\frac{3}{8}$

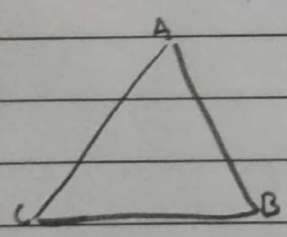
C)

i) Scalene Triangle



It's a triangle in which all the 3 sides are not equal but sum of all three angles is 180.

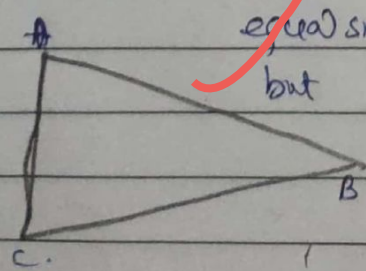
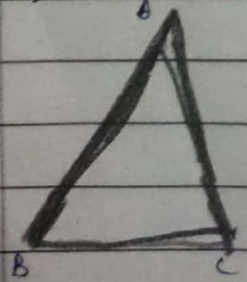
ii) Equilateral Triangle



Angle?

It has 3 equal sides and angles. It is a regular polygon with 3 sides.

iii) Isosceles Triangle:- Isosceles is triangle with 2 equal sides and two equal angles



but third angle is 90 degrees it is also called isosceles triangle.