

## SECTION - B

QUESTION : 06

a)

Data :

Working machine value = Rs. 8748 (after 3 years)

Each year depreciation = 10%

Value of machine three years ago = ?

SOLUTION:

Finding 10% of current price

$$= 8748 \times \frac{10}{100}$$

$$= 874.8 \rightarrow 10\% \text{ of current value}$$

Substituting it from original (current) value

$$= 8748 - 874.8$$

$$= 7873.8 \rightarrow \text{value 1 year before.}$$

Following same method,

$$= 7873.8 \times \frac{10}{100} \Rightarrow 787.38$$

$$= 7873.8 - 787.38 \Rightarrow 7086.42 \rightarrow \text{value 2 years before}$$

Finally,

$$7086.4 \times \frac{10}{100} \Rightarrow 708.64$$

$$7086.4 - 708.6 \Rightarrow 6377.8$$

So, the price of the machine 3 years ago:

$$= \boxed{\text{Rs. 6377.8}} \text{ (Answer)}$$



b.

Data :

Father = 4 times daughter's age

After 5 years = 3 times daughter's age

After more 5 years = ?

Solutions:Age of Father  $\times 4$  = Age of Daughter

$$4x = x \rightarrow \textcircled{1}$$

After 5 years

$$4x + 5 = (x + 5) \times 3$$

$$4x + 5 = 3x + 15$$

$$\boxed{x = 10} \rightarrow \text{put it in } \textcircled{1}$$

So,

The current age of father : 10

The current age of daughter : 40

After 5 years,

Ratio of their age :

$$15 : 45$$

After further 5 years,

$$20 : 50$$

Hence, 2 : 5

Concluding,After 5 more years father is 2.5 years  
of daughter's age.Ans



c.

Data:

Volume of a football = ?

Diameter = 12 cm.

Solution:

We need radius for volume so,

$$\text{Diameter} = \frac{12}{2}$$

$$\text{Radius} = 6 \text{ cm}$$

The formula for the volume of a football,

$$= \frac{4}{3} \pi r^3$$

$$= \frac{4}{3} \pi (6)^3 \quad (\text{considering } \pi = 3.14)$$

$$= \frac{4}{3} (3.14) \times 216$$

$$= \frac{4}{3} \times 678.24$$

$$= 904.32 \text{ cm}^3$$

Answer: 904.32 centimeter cube.

ans: 904.32



d.

Data :

Train in opposite direction.

Crosses a man in = 27 seconds, 17 sec.

Crosses each other = 23 seconds.

Ratio of their speed = ?

SOLUTION :

If speed of one train is 'x', then  
speed of another train is 'y'.

Now,

We know that

Length of the train = Speed  $\times$  Time,

$$1st \text{ Train} = 27x$$

$$2nd \text{ Train} = 17y$$

Equating,

$$27x + 17y = 23$$

Dividing it with the sum of speed,

$$27x + 17y = 23$$

$$x + y$$

$$27x + 17y = 23x + 23y$$

$$27x - 23x = 23y - 17y$$

$$4x = 6y$$

$$2x = 3y$$

Ratio of their speed,

$$2 : 3$$

(Answer)



QUESTION : 07

a)

Data:

Aug. of 7 consecutive numbers is 20  
largest of them = ?

SOLUTION:

7 consecutive numbers,

$x, x+1, x+2, x+3, x+4, x+5, x+6$ .

Aug is,

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

(because, Aug. =  $\frac{\sum x}{\text{no. of terms}}$ )

$$\star \frac{7x + 21}{7} = 20$$

$$\star 7x + 21 = 140$$

$$7x = 140 - 21$$

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

$$\boxed{x = 17}$$

If  $x$  is 17 then largest is,

$$= x + 6 \Rightarrow 17 + 6$$

$$= \boxed{23} \text{ Largest number}$$

(Ans)



b)

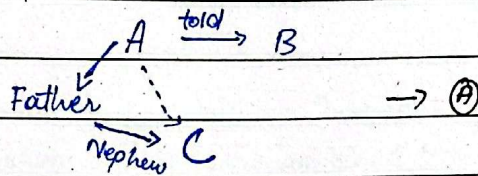
Data:

A told B = C is his father's nephew.

D = A's cousin

D = not brother of C

How D and C relates = ?

SOLUTION:

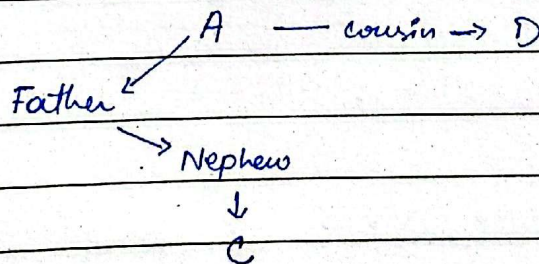
From the statement we came to know that  
A = Male.

Other condition we have,

D  $\xrightarrow{\text{cousin}}$  A  $\rightarrow$  (B)

Also, D and C = not brothers.

Following (A)



Following this,

D is the uncle of C.

*Dr*



c.

Data:

Find missing number of the series.

Solution:

(i) 4, 18, \_\_\_\_\_, 100, 180, 294, 448

The series is going on:  $x^3 - x^2$ 

So,

$$2^3 - 2^2 = 8 - 4 = 4$$

$$3^3 - 3^2 = 27 - 9 = 18$$

$$4^3 - 4^2 = 64 - 16 = 48$$

$$5^3 - 5^2 = 125 - 25 = 100 \dots$$

Answer: 4, 18, 48, 100, 180, 294, 448.

(ii) 1, 2, 10, 37, 101, \_\_\_\_\_

The series follows, cubes of next number,

$$1 + 1^3 = 1 + 1 \Rightarrow 2$$

$$2 + 2^3 = 2 + 8 \Rightarrow 10$$

$$10 + 3^3 = 10 + 27 \Rightarrow 37$$

$$37 + 4^3 = 37 + 64 \Rightarrow 101$$

$$101 + 5^3 = 101 + 125 \Rightarrow 226.$$

Answer: 1, 2, 10, 37, 101, 226.



(iii) 11, 17, 39, 85, \_\_\_\_\_

11, 17, 39, 85, 136.

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

The series is following: (last number  $\times 2$ ) - 2

$$13 \times 2 = 26 - 2 \Rightarrow 24 \dots$$

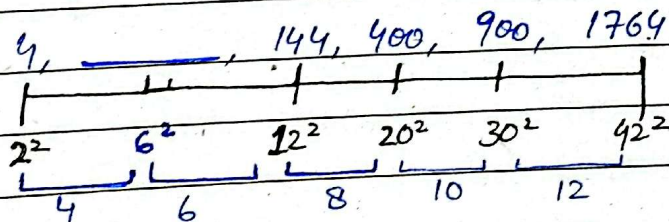
$$46 \times 2 = 92 - 2 \Rightarrow 90$$

$$178 \times 2 = 356 - 2 \Rightarrow 354$$

Answer: 13, 24, 46, 90, 178, 354.

(v) 4, \_\_\_\_\_, 144, 400, 900, 1764

The series is following 'square' but in a proper form,



Answer: 4, 36, 144, 400, 900, 1764.



d)

Data:

Money distributed in Ratios

$$A : B = 1 : 2$$

$$B : C = 3 : 2$$

$$C : D = 3 : 4$$

D<sup>o</sup> of shares of A and D = 2240

B's share = ?

SOLUTION:

$$A : B :: C : D$$

$$1 : 2 :: 3 : 2$$

$$2 : 6 \Rightarrow \boxed{1 : 3}$$

$$1 : 3 :: 3 : 4$$

$$\boxed{4 : 9}$$

A's share,

$$\frac{1}{17}$$

D's share,

$$\frac{9}{17}$$

D<sup>o</sup> of A and D to solve B's share.

$$\frac{1}{17} - \frac{9}{17} = \frac{1-9}{17} = \frac{-8}{17} = 2240$$

~~D<sup>o</sup> of A and D share, 4~~

$$\frac{3}{17} = 2240 \Rightarrow \boxed{12693.3 \text{ B's share}}$$

Ans



SECTION - AQUESTION: 04

a)

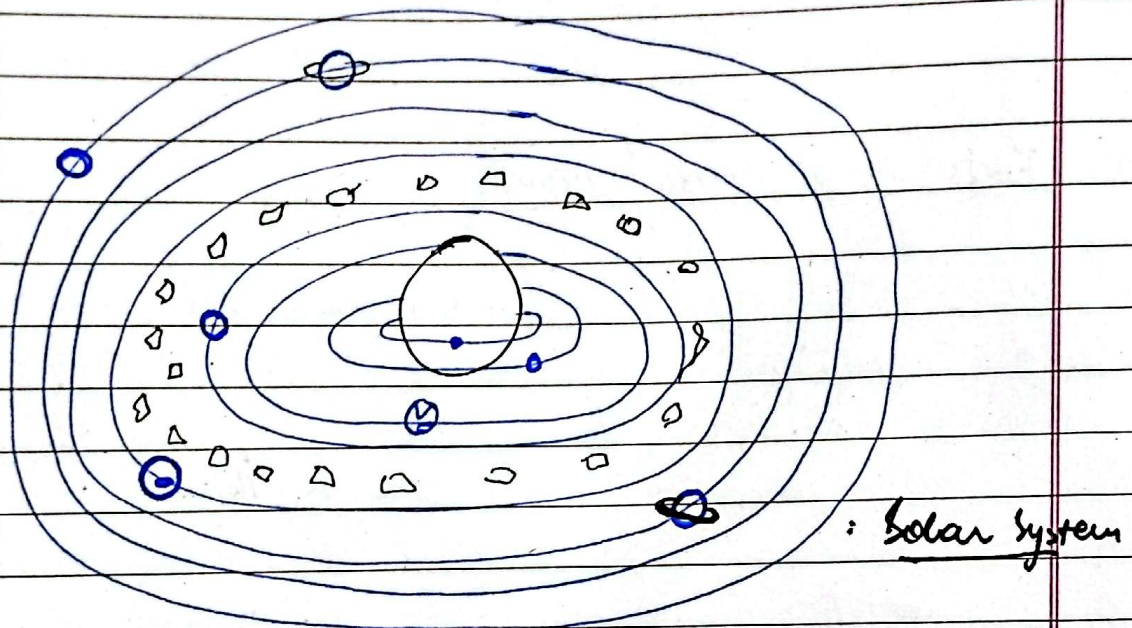
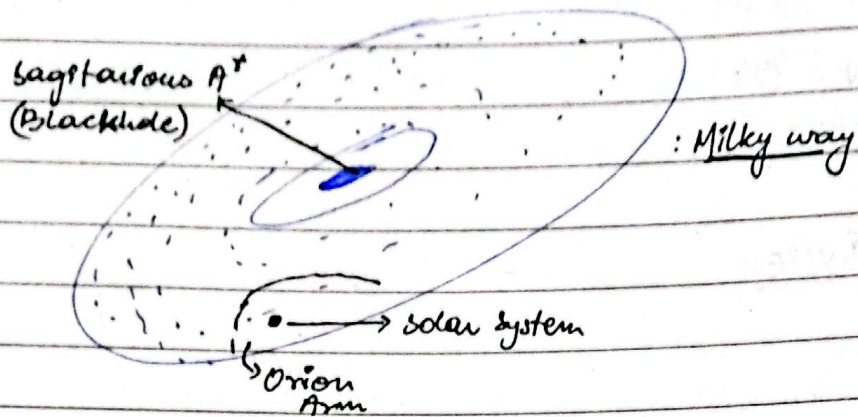
1. SOLAR SYSTEM

Solar system is a collection of planets, moons, and other space bodies such as asteroids that revolve around a Sun. All the planets in solar system have their own gravity but Sun's gravity dominates.

2. FACTS ABOUT SOLAR SYSTEM:

- i) Our solar system is 4.6 bn years old
- ii) Our solar system has star or sun at the center that is a yellow dwarf.
- iii) The astronomical name of sun is Helio. ☀
- iv) Our solar system has eight planets in total.
- v) The planets are either rocky or gaseous in solar system.
- vi) There is an asteroid belt in our solar system that is between Mars and Jupiter.
- vii) Every planet revolves around the sun and its own axis
- viii) The sun also revolves around its own axis along with around the black hole, Sagittarius A\*, at the center of Milkyway.
- ix) Until now, sun has revolved around 22 times around milkyway, known as galactic year.
- x) Our solar system is in Orion belt of Milky way.





### 3. Planets:

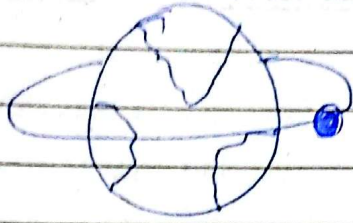
- |      |         |       |         |
|------|---------|-------|---------|
| i.   | Mercury | v.    | Jupiter |
| ii.  | Venus   | vi.   | Saturn  |
| iii. | Earth   | vii.  | Uranus  |
| iv.  | Mars    | viii. | Neptune |

- Venus has longest day in our solar system.
- Jupiter has the shortest day
- Mercury has the shortest years.
- Neptune has the longest years.
- Earth is known as blue planet.
- Moon of Earth is tightly locked. (to Earth's gravity)

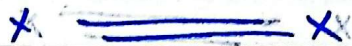


- Saturn has the most number of moons (100+).
- Only Uranus and Saturn have ring rings.

#### 4. EARTH :



- Earth is the only planet with life.
- Earth has one moon known as Luna.
- Earth is  $23.5^\circ$  tilted to its axis.
- It takes 365.25 days to have an year on earth.
- Astronomical name of Earth is Terra.
- Earth has Oceans, Rivers, Atmosphere that make life possible.



b.

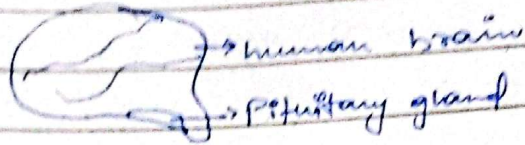
#### 1. PITUITARY GLAND :

It is gland in human brain, at the base, that controls other glands. Its functioning is important for overall body.

#### 2. FUNCTION OF PITUITARY GLAND

- It releases hormones and command other glands to do so.
- It also regulates bodily functions.





### 3. SIGNIFICANCE OF PITUITARY GLAND

- i) Regulates sweating
- ii) Controls and manages hormonal discharge
- iii) It helps in growth of overall body.
- iv) Metabolism is controlled by it.
- v) Reproduction is facilitated by it.
- vi) Salt balance in body
- vii) Stress management is also done by it.
- viii) It is known as Master Gland because it controls all other glands.

X                      X

c.

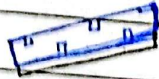
#### RAM:

It stands for Random Access Memory.  
It is computer's main memory, storing data for the time being.

#### ROM:

It stands for Read-only memory.  
It is used for permanent storage of data.  
Without it, data will be deleted once computer is shut-down.





RAM



USB



Harddrive

ROM

3. DIFFERENCE BETWEEN RAM AND ROM

RAM	ROM
<ul style="list-style-type: none"> <li>• Volatile memory storage</li> <li>• Quick access for running programs</li> <li>• Faster speed</li> <li>• Less storage</li> <li>• Active when work done.</li> <li>• Examples: Flash memory, SD-RAM</li> </ul>	<ul style="list-style-type: none"> <li>• Non-volatile storage.</li> <li>• Used for computer's instructions only.</li> <li>• Slow in speed</li> <li>• More storage</li> <li>• Works in background.</li> <li>• Examples: USB, Hard-drives.</li> </ul>

4. NIBBLE

Unit of data comprised of 4 <sup>bits</sup> bytes. It is less than a byte which is of 8 bits. It is a way of transmitting information.

- Application:
- i. In programming language such as Python.
  - ii. ~~low~~ low-level programming.



### 3. USB

It stands for Universal ~~serial~~ serial bus. (USB). It is used for storage purpose mainly. USB can also exchange information.



#### • FUNCTION:

- i. Storage of data for longer period of time.
- ii. File transferring.
- iii. Upload Data.

### 4. MOTHERBOARD

It is a circuit board in a computer. Its purpose is to let all the components of PC communicate with each other.

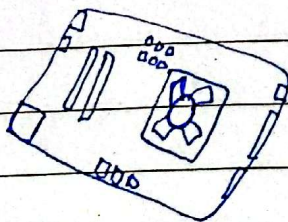
#### • SIGNIFICANCE :

It connects all the transistors, components and wires on single platform.

Backbone of PC.

Without it, RAM, hard-drive, graphic cards cannot work.

All components are connected on it with peripheral connections.



Motherboard.



d.

1. COP29:

Cop29 happened in Baku where 200+ countries participated along with NGOs and independent bodies to discuss climate challenges. This was the 29th Conference of Party (COP) under UNFCCC of UN.

2. AIMS OF COP29:

- i. Limit global temp. to 1.5°C
- ii. Regulate Climate Fund.
- iii. Switch to renewables.

3. COP29 IS A FAILURE:

It is a failure because the proposal drafted by developing world to finance climate fund was not accepted by majority of countries. Other than that there was no sanction over non-renewable energy sources. Lastly, global temperature has surpassed the 1.5°C so it is vague to point such a aim.

4. IMPLICATIONS OF COP29:

- i. Global temperature limit put to 1.75°C now.
- ii. Climate fund is a myth.
- iii. The world will witness another record breaking climate disaster year due to Cop29 failure.

X                      X



## QUESTION : 03

a)

1.

### PROTEINS

They are made up of chemical bonds called amino acid. Their function is to repair muscles and bones. They are the sources of energy, without them a person feels lazy.

2. SOURCES:

- i. Fish.
- ii. Meat.
- iii. Eggs.

3. DIGESTION OF PROTEIN

- i) Chewing: First step of digestion through teeth.
- ii) Stomach: Hydrochloric acid in stomach break down proteins in food.
- iii) Small intestine: The amino acid are further break-down here. Per absorbed in body.

4.

### CARBOHYDRATES

They are sugar molecules basically. Carbohydrates provide energy to a body. Glucose is their product that is used by body to regulate sugar levels in the blood.  $C_6H_{12}O_6$  is its example.

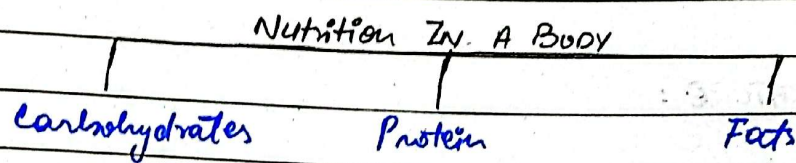


5. SOURCES :

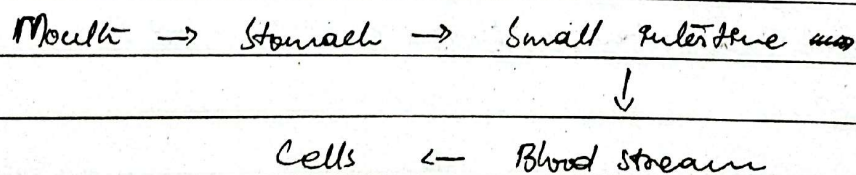
- i. Grains
- ii. Bread
- iii. Rice

6. WHY IS IT IMPORTANT?

It is one of the main nutrient a body require besides protein and fats. Its excessive levels can be dangerous, causing diseases.

7. DIGESTION OF CARBOHYDRATES

Its breakdown is common as protein but after small intestine, it goes into bloodstream and cells. In this way, sugar in blood is managed. If sugar level high then insulin is released by pancreas.





b)

1. ATMOSPHERIC PRESSURE:

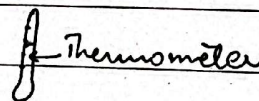
It's the force exerted by the air pressure upon a body. This exists due to the pull of Earth's gravity. Barometer is used for its measurement. It is measured in 'bars'. On average, 14.7 pounds per square inch is the atmospheric pressure on Earth. It decrease with altitude, therefore, water does not boil at  $100^{\circ}\text{C}$  on mountain top. This occurs due to the inverse relation between pressure and temperature.

2. TEMPERATURE:

It is the average increase or decrease of kinetic movement of particles in a certain place. Thermometer is used for its measurement. It holds inverse relation with pressure, but direct with volume. Celsius, Fahrenheit or kelvin scale is used for its unit. It defines sustainable environment for living thing.



Barometer



Thermometer

- Normal body temperature is  $96^{\circ}\text{F} - 98^{\circ}\text{F}$   
Mercury is used in thermometer.



### 3. HUMIDITY

The amount of water vapours in environment is called humidity. It helps to maintain moisture and temperature in the air and surrounding. Its significance can be seen in Australian bush fire, California fire that happened due to lack of moisture. However, excessive humidity is also bad as it can cause water everywhere from buildings, to tables. This recently happened in China. To put things in perspective, hurricanes are the result of high humidity. It is measured by hygrometer in gram per meter cube.

43
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00

x \_\_\_\_\_ x

c.

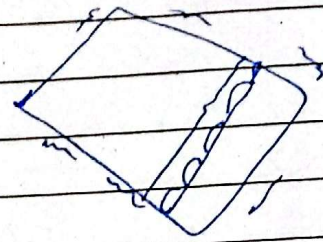
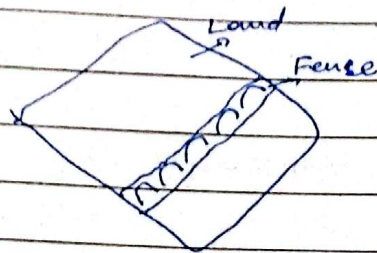
### EARTHQUAKE:

It is a natural phenomenon that is caused because of the movement of plate tectonics. It is short-lived from seconds to minutes. Earthquake have three stages,

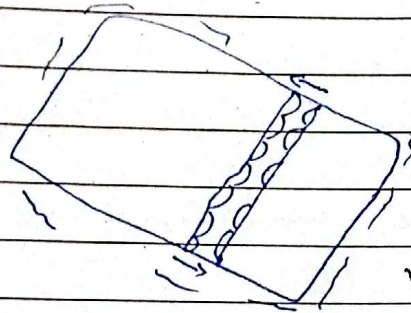
- i. Focus
- ii. Origin
- iii. Event



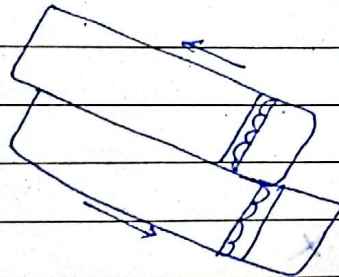
## 2. EPHEMERON OF EARTH - QUAKE



Vibrations



vibrations making plates going divergent.



land is divergent because of Earthquake.



d.

## RADAR

It is a system that uses radio waves to determine distance, direction and velocity of an object. It works under high skill-set and usually used for military purpose.



## • WORKING OF RADAR

Radar stands for 'Radio Detection and Ranging.' Its working is as,

### SENDS SIGNAL:

A radar sends signal out in radio waves. The waves bounce off and return to radar.

### Analysis by RADAR

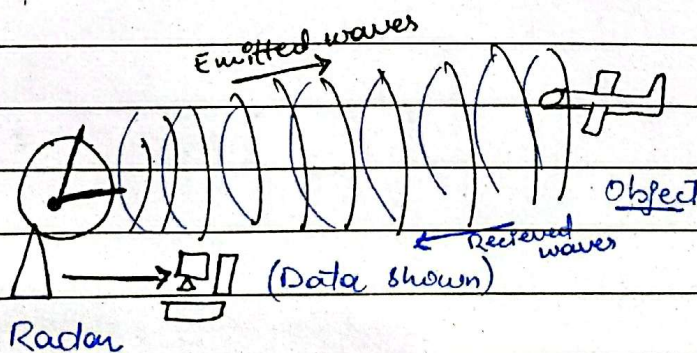
Radar analysis the amount of time in sending and receiving to estimate the distance. It further analyze the frequency of 'sent signal' with 'received signal' to know the velocity of object.

### OUTPUT:

Radar then provides user with output in the form of visual data or numericals. It is common in many places.

### APPLICATIONS

Air traffic control, self-driving cars, Fighter planes, police radar to catch over-speed.



• Functioning of RADAR