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Section II

Qno:- 06

Given-

$$a + b + c = 15$$

$$b + c = 12$$

$$b - c = 2.$$

find out the 3 digit number?

Sol:-

$$a + b + c = 15 \text{ --- (i)}$$

$$b + c = 12 \text{ --- (ii)}$$

$$b - c = 2 \text{ --- (iii)}$$

$$b + c = 12$$

$$b - c = 2$$

$$2b = 14$$

To further solve it:- $2b = 14$

$$b = \frac{14}{2}$$

$$b = 7$$

$$b = 7$$

now putting the value of b in eq (ii)
to find out the value of c .

$$b + c = 12 \text{ --- (ii)}$$

$$7 + c = 12$$

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$$c = 12 - \frac{7}{5}$$

$$c = 5$$

now putting the value of b and c in equation (1) to solve the problem -

$$a + b + c = 15$$

$$a + 7 + 5 = 15$$

$$a + 12 = 15$$

$$a = 15 - 12$$

$$a = 3$$

now putting the value of a, b and c in first equation to make it a three digit number -

$$a + b + c = 15 \quad \text{--- (i)}$$

$$3 + 7 + 5 = 15$$

$$15 = 15 \rightarrow \text{proved}$$

$$b + c = 12 \quad \text{--- (ii)}$$

$$7 + 5 = 12$$

$$12 = 12 \rightarrow \text{proved}$$

$$b - c = 2 \quad \text{--- (iii)}$$

$$7 - 5 = 2$$

$$2 = 2 \quad \text{proved}$$

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(b)

Data:-

Ordered pizza's for 18 person

Small: medium: large

ratio of their slices

$$2 : 3 : 4$$

weight of slice of pizza = 40 gm.

price for small = 320.

Total price of Pizza ?

Total weight of pizza ?

Sol:-

Small : medium : large

$$2 : 3 : 4$$

for each slice for 18 person requires
two of each pizza.

$$2(2) : 3(2) : 4(2)$$

$$4 : 6 : 8$$

Since the price of small pizza is 320 for
4 slices, let's calculate to find out the

price of each slice = $\frac{\text{Price of pizza}}{\text{total num of slices}}$

$$\text{Price of per slice} = \frac{320}{4} = 80.$$

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now calculate the price for medium pizza
denoting P_m and large P_L .

$$P_m = \text{price of per slice} \times \text{slice of pizza}$$

$$P_m = 80 \times 6$$

$$P_m = 480$$

now find out for the large pizza

$$P_L = \text{price of per slice} \times \text{total no. of large pizza slice}$$

$$P_L = 80 \times 8$$

$$P_L = 640$$

now calculate the total weight of pizza =

$$P_s + P_m + P_L =$$

$$320 + 480 + 640 = 1440$$

Now calculate the total weight of pizza.

weight of per slice \times number of slices

$$P_s = 40 \times 4 = 160$$

$$P_m = 40 \times 6 = 240$$

$$P_L = 40 \times 8 = 320$$

$$\underline{720}$$

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Hence the total weight of the pizzas is
720 grams, and the total price is
1440.

(c)

Sol:-

Diameter = 6 cm

find the circumference and area
of a circle?

$$R = \frac{\text{diameter}}{2} = \frac{6}{2} = 3.$$

Sol:-

$$C = 2\pi r$$

$$C = 2 \times 3.14 \times 3$$

$$C = 18.84$$

now find the area of a circle

$$A = \pi r^2$$

$$A = 3.14 \times (3)^2$$

$$A = 3.14 \times 9$$

$$A = 28.26$$

Ans

$$\begin{array}{r} 3 \\ 3.14 \\ \times 9 \\ \hline 28.26 \end{array}$$

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(D)

(i) $13, 24, 46, 90, 178, 354$

$\begin{array}{cccccc} & \nearrow & \nearrow & \nearrow & \nearrow & \\ & \times 2 & \times 2 & \times 2 & \times 2 & \\ & - 2 & - 2 & - 2 & - 2 & \end{array}$

The answer is 354, as the difference of the series is multiplication with 2 and then minus -2 to get the answer.

$$\begin{array}{r} 13 \\ \times 2 \\ \hline 26 \\ - 2 \\ \hline 24 \\ \times 2 \\ \hline 48 \\ - 2 \\ \hline 46 \\ \times 2 \\ \hline 92 \\ - 2 \\ \hline 90 \\ \times 2 \\ \hline 180 \\ - 2 \\ \hline 178 \\ \times 2 \\ \hline 356 \\ - 2 \\ \hline 354 \end{array}$$

(ii) $5, 6, 9, 14, 21, 30$

$\begin{array}{cccccc} +1 & +3 & +5 & +7 & +9 & \\ \hline \end{array}$

The differences in the series is the odd number, so the last number would be 30 by the difference of series as 9.

Ques 7

(A)

Emotional Quotient (EQ)

Refers to the ability of recognize, understand, manage and influence emotions.

It emphasizes emotional intelligence, which includes self awareness, empathy, motivation and social skills.

It is typically measured by emotional intelligence test, focusing on scenarios and conflicts.

It helps in managing personal relationships and growth.

Intelligence Quotient (IQ)

It refers to the mental cognitive ability, such as logic, reasoning, problem solving skills.

It assesses the intellectual capacity of solving complex problem and learn quickly.

3. It is assessed through standardized test that assess ability of mathematics, logical reasoning and memory.

It is often seen as an indicator of academic success.

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(B)

$$x + 20 = 10(x - 10)$$

$$x + 20 = 10x - 100$$

$$20 + 100 = 10x - x$$

$$120 = 9x$$

$$9x = 120$$

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

$x = 13.33$ (present age of Aman)

(C)

Data:-

Peter can mow a lawn = 40 minutes

John can mow a lawn = 60 minutes

Together = ?

Sol:-

$$\frac{1}{\text{Peter}} + \frac{1}{\text{John}} = \frac{1}{\text{Total}}$$

$$\frac{1}{40} + \frac{1}{60} = \frac{1}{N}$$

$$\frac{3}{120} + \frac{2}{120} = \frac{1}{N}$$

$$\begin{array}{r} 60 \overline{)120} \quad | 2 \\ \underline{120} \\ 0 \end{array}$$

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$$\frac{5}{120} = \frac{1}{N}$$

$$5N = 120$$

$$N = \frac{120}{5} = 24$$

$$N = 24$$

It means the both peter and John can mow the lawn in 24 minutes.

(D)

The number that needs to be multiplied by $\frac{5}{3}$ but it mistakenly multiplied with $\frac{3}{5}$

$$\frac{5x}{3} - \frac{3x}{5} = \frac{16x}{15}$$

$$\text{for error \%} = \left[\frac{16x}{15} \div \frac{5}{3} \right] \times 100$$

$$64\%$$

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Section I

Qno: 03

(A)

Sun:-

The Sun is a star in the solar system. It is a massive hot plasma, heated to incandescence by nuclear fusion reaction at its core, radiating its energy from its surface mainly as light.

Structure of Sun:-

The Sun is a huge and massive star composed of many layers with each with distinct feature. Some of them are listed hereunder.

1. Core:-

It is the most innermost layer of the sun and it is where all the nuclear fusion reaction take place. Here hydrogen atoms fuse into helium, releasing vast amount of energy.

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Radiative zone:-

The energy produced in the core of the sun is transported outward through this zone. photons are absorbed and re-emitted many times here.

Convective zone:-

Energy transport through convection current in this layer. Hot plasma generated, cools and settles down.

photosphere:-

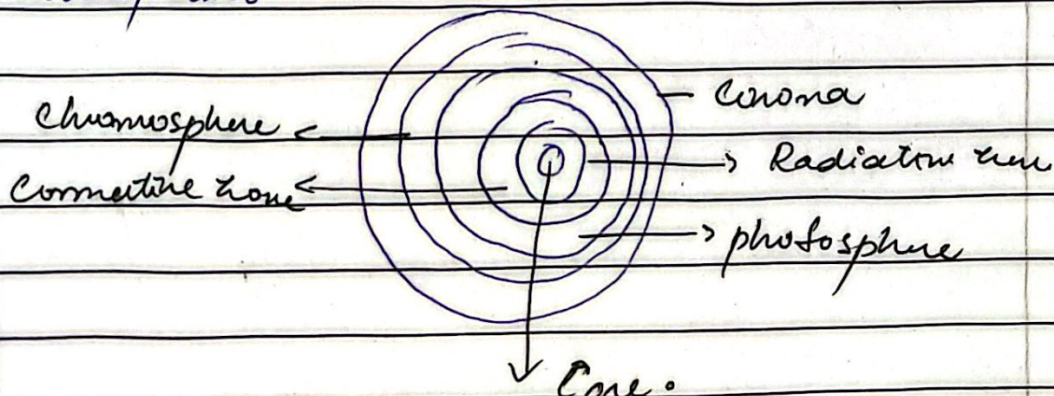
It is the visible surface of the sun, emitting the light we see.

Chromosphere:-

It is a reddish line right above the photosphere.

Corona:-

It is the outermost layer of the sun. It gets visible during solar eclipse during halo around sun.



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(B)

Tsunami-

Tsunami is a large displacement water bodies, it is often comes in a series of large, sudden and powerful waves that are destructive in nature.

Causes of Generation:-

Tsunami is a result of many causes and a few of them are listed down below.

1. Underwater earthquakes:-

when tectonic plates shift, it causes a displacement of the ocean floor, pushing large amount of water upwards to flow.

2. Volcanic Eruption:-

volcanic eruption are also considered it causes especially if it is erupted underwater resulted in large water bodies creating tsunamis.

3. Landsliding:-

When large amount of debris, such as rocks or soil slide into water causes water

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water to flow upward powerfully disturbs the natural current and causes tsunami.

Recent Tsunami's event:-

Hunga Tonga

Hunga tonga erupted in the month of January, 2022 due to volcanic eruption. It has been recorded the largest since the Krakatoa in 1883, as it hit Pacific as well as Mediterranean sea.

(C)

Environmental pollution:-

Environmental pollution is the introduction of foreign and potentially harmful elements in the environment - that makes it dangerous for the living beings. It is of many kinds, including air pollution, noise pollution, dust and smog pollution and many more.

How environmental pollution generated:-

There are many reasons and

causes as how it gets generated. Some of them are discussed below.

① Industrial Activities:-

Factories power plants, and industrial processes emit carbon dioxide (CO_2), Sulphur dioxide (SO_2) and nitrogen oxide (NO_x), these are hazardous for humanity. Moreover, these chemicals released in nearby water streams that result in death of aquatic animals.

② Transportation:-

Vehicles and transportation system are significant in polluting the environment to an extent of unbreathable.

③ Waste disposal:-

Burning of waste, especially plastic, releases toxic fumes like dioxins and carbon monoxide and improper disposal of waste are some of its root causes.

Ways to curb it:-

1. Shifting towards sustainable practices of renewables by avoiding fossil fuel.

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2. Sustainable and urban smart cities - not concrete of jungles.

3. Afforestation is the need of the hour.

4. Strict mechanism of checking and controlling hazardous practices of disposal of waste.

(D)

Wireless Communication:-

Wireless

Communication is the transfer of information between two or more points without the use of an electric conductor, optic fiber or any other means. Wireless communication

takes place through the signals of satellites received on the towers and then spread across the different areas.

Working of a Satellite:-

Satellite is a

man made object that orbits around a star, planet, moon or earth. It functions on the basis of physics motion of gravity. Some of ways how satellite works are discussed below.

1. Launch and Orbit Insertion:-

Satellites are

launched in space by the rockets at a particular speed and then when it reaches a certain height - it gets enter into the orbit according to its purpose.

2) Gravitation and orbits -

Earth continuously pulls the satellite towards it, while there is a forward force in the space that pulls it towards itself that keeps it in the orbit without falling back to earth.

3) Satellite for communications -

Communication
Satellite of air contain antennas and transponder. This device allow them in sending and receiving signals to and from earth.

4. Satellite operations :-

Satellite operations are controlled and monitored by the ground station in Earth. These stations send commands to the satellite in adjusting its orientation.

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Qno:- 04

(4)

Hepatitis:-

Hepatitis is a disease of liver that is mainly transmitted by ingestion of infected food or water. Hepatitis is of many types.

Hepatitis B:- It is caused by the HBV virus, and it is a result of human intercourse.

Hepatitis C:- It is termed as Chronic virus as it is caused by the consumption of toxic substance like alcohol.

Hepatitis E:- It gets transmitted from animals to human by eating raw or insufficient pork.

Symptoms:-

1. Upper abdominal pain, Soreness
2. Nausea or loss of appetite
3. Fatigue
4. Fever
5. Jaundice and Itchy skin
6. Excessive consumption of Alcohol
7. Unprotected Sex.

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Prevention:-

1. Getting vaccinated as vaccines for hepatitis A and B are available in the market.
2. practicing good hygiene
3. Managing metabolic factors such as controlling blood pressure and sugar.
4. Balancing alcohol consumption.

(B)

Food preservation:-

Food preservation is a process for increasing the shelf life of food for keeping it fresh for a longer time. Food preservation is also known for protecting the food from spoilage, decay or contamination by keeping its nutrient, texture and flavour intact.

Ways for preserving food:-

There are many ways of preserving food and some are discussed here in brief.

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Refrigeration and Freezing:-

It involves in refrigerating and freezing a food at a certain temperature to keep its nutrient alive. It is widely used in dairy products, frozen vegetables and fruits, meat.

Canning:-

Food is heated to kill bacteria and other organisms, then sealed and airtight to containers usually jars to prevent re-contamination.

Salting and curing:-

Food has been preserving by adding salt to dry out moisture, making it inhospitable for the bacteria. In curing salt, sugar or nitrate adds to preserve the food.

Pickling:-

Food is preserved in a solution of vinegar (or brine) and spices. The acid in vinegar or the salt in brine prevents spoilage and microbial growth.

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(C)

Fertilizer:-

Fertilizers are substances that are added to soil on plants to provide essential nutrients for its growth. They help in the quality and yielding of the crops by enriching the soil with required nutrients and chemicals.

Types of fertilizers:-

1- NPK or Complete fertilizer:-

These fertilizers contain all three of phosphorus, potassium and nitrogen in the definite quantity.

2. Incomplete fertilizers:-

The name describes itself, they are incomplete as they lack either one or two of the nutrients depends on the requirement of the crop and soil.

Based on Origin:-

1. Organic Fertilizer:-

These are derived from natural sources and are more environmental.

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friendly. They improve soil structure, water retention, and microbial activity. They are animal based fertilizers, plant or fungi based.

Inorganic fertilizers:-

These are chemically manufactured and provide a concentrated form of nutrients. They are faster in acting than that of natural fertilizers. urea is used as a fertilizer or complete fertilizer.