

Section - II

Question #6

(a)

Sum of 3 digits is 15

Let 3 digits are x, y, z

$$x + y + z = 15$$

~~x =~~ hundreds

$$y = 10^{\text{th}}$$

$$z = \text{unit}$$

$$x + y + z = 15$$

$$y + z = 12 \quad \text{--- (1)}$$

$$z - y = 2$$

$$y = 12 - z$$

$$y = 12 - z$$

$$z - (12 - z) = 2$$

$$z - 12 + z = 2$$

$$2z - 12 = 2$$

$$2z = 2 + 12$$

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

$$\boxed{z = 7}$$

Putting value of z in eqn (1)

$$y + 7 = 12$$

$$y = 12 - 7$$

$$\boxed{y = 5}$$

Three digits number is

$$x + 5 + 7 = 15$$

$$x + 12 = 15$$

$$x = 15 - 12$$

$$\boxed{x = 3}$$

$$= \boxed{357}$$

(c)

Diameter of circle is 6cm. Find circumference and area of circle.

$$\text{Circumference} = C = \pi d$$

$$\text{Area} = A = \pi r^2$$

$$D = 2r$$

$$r = \frac{D}{2} = \frac{6}{2} = 3$$

$$= \pi \times d$$

$$= \frac{22}{7} \times 6$$

$$C = 18.84$$

$$A = \pi r^2$$

$$= \frac{22}{7} \times 3^2$$

$$A = 28.27 \text{ cm}^2$$

(d)

Identify the missing

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

13, 24, 46, 90, 178

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

(ii)

5, 6, 9, 14, 21
= 5, 6, 9, 14, 21, 30

Question #8

(a)

Distinguish between IQ and E.Q

IQ stands for intelligence quotient which measures cognitive abilities, such as logical reasoning, problem solving and understanding complex ideas. It focuses on intellectual and analytical intelligence.

E.Q stands for emotional quotient, including the ability to recognize, understand, and manage emotions in oneself and others. It emphasizes interpersonal and communication skills.

(b) (ii)
Aman's Age Problem

Let Aman's current age = x

After 20 years his age will be 10 times his age 10 years ago.

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

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

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

$$-9x = -120$$

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

$$= \boxed{13.33 \text{ years}}$$

(c)

Peter's rate = $\frac{1}{40}$ lawn per minute

John can mow the lawn in 60 minutes

so his rate is

John's rate = $\frac{1}{60}$ lawn per minute

Working together

combined $\frac{1}{40} + \frac{1}{60}$

$$= \frac{3}{120} + \frac{2}{120} = \frac{5}{120} = \frac{1}{24}$$

$$\text{Time} = \frac{1}{\text{combined rate}} = \frac{1}{\frac{1}{24}} = 24 \text{ minutes}$$

(d)

The person multiplied a number by $\frac{3}{5}$ instead of $\frac{5}{3}$. Let the number be x .

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

incorrect result

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

Error in result

$$= \frac{5x}{3} - \frac{3x}{5} = \frac{25x - 9x}{15} = \frac{16x}{15}$$

$$\text{Percentage Error} = \frac{\text{Error}}{\text{correct result}} \cdot 100 = \frac{\frac{16x}{15}}{\frac{5x}{3}} \cdot 100$$

$$= \frac{16}{15} \cdot \frac{3}{5} \cdot 100 = \frac{48}{5}$$

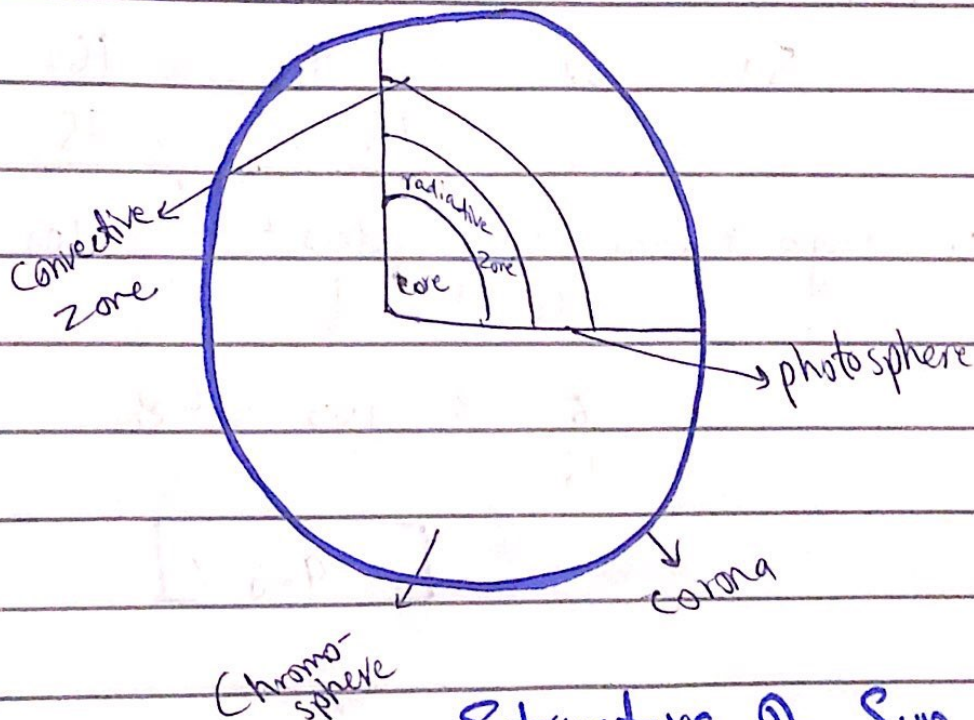
$$= 9.6\%$$

Question #2

Structure of Sun

Sun is a star having several layers. These layers play vital role in its energy production and emission. The key layers are

1. Core
2. Radiative Zone
3. Convective Zone
4. Photosphere
5. Chromosphere
6. Corona



Structure of Sun

1. Core - The innermost layer

- The innermost layer where nuclear fusion occurs, converting hydrogen into helium.

- Energy is produced here in the form of gamma rays.
- Temperature = 15 million °C

Radiative Zone - Produces Radiations

- Energy from the core travels outwards through this layer by radiation.

- 2 to 7 million °C is the temperature there.

Convective Zone - Convection Currents

- Energy is transported by convection events.

Photosphere - Visible surface of the sun

It is the visible surface of the sun. The temperature of this layer is approximately 5,500°C

Chromosphere - Visible during solar Eclipse

A thin layer above the photosphere emitting red light during solar eclipse.

Corona

The outermost layer, visible during solar eclipse.

(b) Tsunami - Definition

Tsunami is a series of large ocean waves caused by disturbances such as undersea earthquakes, volcanic eruption or landslides.

How it is Generated

→ Underwater seismic activity, such as earthquake, displaces a large volume of water.

→ The displacement creates waves that travel across the ocean at high speeds.

→ As the waves approach shallow coastal areas, they increase in height and energy, causing destruction upon impact.

Recent Examples of Tsunami

2004 India Ocean Tsunami

Triggered by a 9.1 magnitude earthquake near Sumatra.

2018 Sulawesi Tsunami (Indonesia)

Generated by a 7.5 magnitude earthquake.

Environmental Pollution (c)

Environmental pollution refers to contamination of natural environment by harmful substances or activities.

Harmful Effects of environmental Pollution

Air Pollution

Air pollution causes respiratory problems, global warming and acid rain.

Water Pollution

Harms aquatic life, spreads disease, and affects drinking water.

Soil Pollution

Reduces soil fertility, harms plants and affects food security.

Noise Pollution

It leads to stress, hearing loss, and disturbed ecosystems.

Measures to curb Pollution:

1. Renewable energy resources like solar and wind should be promoted.
2. Reduce, reuse and recycle waste management should be applied.
3. Awareness campaigns should be raised.

- regarding harmful effects of pollution
4. More trees should be planted.
 5. Strict regulations on waste disposal and industrial emissions must be implemented.

(d)

Wireless Communication

Wireless Communication is the transmission of data or signals without physical connections, typically using radio waves, microwaves or infra-red signals.

Satellite Communication

A satellite is a device orbiting the Earth that relays communication signals between ground stations.

Working of Satellite Communication

A ground station transmits signals (uplink) to a satellite.

A satellite amplifies the signal and retransmits it to another ground station.

The satellite operates on frequencies

such as C-band or Ku-band for data transmission

- Uses:
1. Global communication (e.g. internet)
 2. T.V broadcasts)
 3. Weather forecasting
 4. GPS and navigation system