

21/10/25

General Science & AbilityPart II: "Section I"

Q#4:-

Ans (A) :-

Chlorophyll:

Chlorophyll is a green pigment found in chloroplasts of plant cells. Its function is to capture sun light and convert it into chemical energy during process of photosynthesis. This process helps plants to form glucose from carbon dioxide (CO_2) and water (H_2O), releasing oxygen as a by-product. There are different types of chlorophyll mainly A & B that absorb light in the blue and red regions of the spectrum. It helps plants to survive as well as giving them green colour.

(B) Role of Ribosomes:

Ribosomes are the small organelles present in the ~~ribosomes~~ cytoplasm or attached to the endoplasmic reticulum. They are the site of protein synthesis, ribosomes read mRNA sequence and translate it into chain of amino acids by tRNA molecules carrying specific amino acids. That amino acid chain then folds into a functional protein making ribosomes ~~act as~~ act as the "protein factories" of the cell.

②: Methods of solid waste management:

→ There are different types of methods used to manage the solid waste:

① Land filling:

In this method, the waste after the collection is compacted and then buried in specially designed sites. It is the most common method but can cause ~~land~~ pollution if not managed properly.

② Recycling:

This method involves the reusing of waste materials like paper, plastic, glass and metals, helps in controlling and managing wastes as well as conserving energy and resources.

③ Composting:

In composting, organic wastes such as food and green waste is converted into compost (natural fertilizer) for agricultural use. This method is being promoted to reduce landfill and improve soil health.

④ Open Dumping:

Most common method used in many cities and towns of underdeveloped regions of world. In this method, waste is dumped in open areas without proper treatment at very cheap price but it causes pollution, bad odor and breeding of insects further causing health diseases.

⑤ Source Reduction: This method involves reducing waste generation at the source through efficient use of materials and better product design.

(a) i) Biofuels:

It is a renewable energy source made from organic materials such as crops, algae or animal waste.

→ E.g.: Ethanol from sugarcane

Biodiesel from vegetable oils

Biofuels reduce dependency on fossil fuels and lower carbon emissions.

ii) Adulteration:

The practice of adding low-quality, cheap and harmful substances to products like food, milk or fuel to increase profit resulting in reduced quality and health hazards.

iii) Hydrosphere:

Hydrosphere refers to all the water present on Earth - in oceans, rivers, lakes, glaciers, underground and even in the atmosphere.

It plays a vital role in climate regulation and support all life forms.

iv) Troposphere:

Troposphere is the lowest layer of Earth's atmosphere about 10-20 km thick where all weather phenomena like clouds, rain and storm occurs. It contains most of the air mass and it is warmest near Earth's surface.

v) Isotopes:

Isotopes are different forms of same element having same number of protons but different numbers of neutrons.

E.g.: (Carbon-12 and Carbon-14) Both are isotopes of carbon.

Q5:

(a) Causes:

(1) High birth rate: Due to lack of family planning and cultural preference for large families.

(2) Low literacy Rate:

Rate of literacy is very low especially among poor families women, leading to less or poor awareness about reproductive health.

(3) Early marriages:

Early marriages means the increase period of childbearing years of women.

(4) Poverty:

Due to poverty, many families see children as future earners, the big the family income will be large.

(5) Religious factor:

Hesitation towards the using of contraceptives.

Control Measures

(1) Promote family planning programmes and awareness campaigns.

(2) Education, especially for women to let them know about their reproductive health.

(3) A little delay in the marriages as well as improving the maternal health services.

(4) Economical development and job creation to break the myth and child dependency to earn.

(5) Provide incentives to small families by making policies, which may encourage people to number their members.

⑤ Remote Sensing:

RS is the technology of collecting information about Earth's surface without any sort of physical contact. It is usually done through satellites, drones or aircraft sensors. It records data in the form of images used for mapping & monitoring.

→ Role of GIS in Environmental Science:

GIS helps in storing, analyzing and displaying the geographical referenced data. Its role in Environmental sciences are:

- Monitor deforestation
- Land use and urban growth monitoring
- Tracks climate shift and its impacts
- Management of natural resources
- Plan disaster management and conservation projects.

RS and GIS, both provide vital information for environmental monitoring and sustainable planning.

⑥ Atmosphere as Earth's blanket, Justification:

→ Atmosphere is sort of Earth's blanket because:

- ① It helps regulating surface temperature keeping the planet warm enough to sustain life.
- ② Acts as a barrier between Earth and UV rays.
- ③ Contains required gases like CO_2 and O_2 essential for respiration and photosynthesis.
- ④ Supports Ecosystem by changing weather patterns. E.g: Rainfall.

(d) Define:

i) Hydrometer:

Instrument used to measure the density or specific gravity of liquids. Often used in laboratories or industries like brewing & battery testing.

ii) Epicenter:

Point on Earth's surface directly above the origin of an earthquake.

iii) Eye wall of cyclone:

It is a ring of thunderstorms ~~into~~ circling/around the calm eye of cyclone.

iv) Deep focus:

Earthquake that originates below the Earth's surface, typically at depth greater than 300 km within subduction zone.

v) light year:

It is a unit of distance that represents how far the light travels in one year.

Section II :

Q#6:

(a)

Apple : Berry : cherry : Date
3 : 6 : 2 : 5

→ Apple > Date by 35
3 : 5 = 35

$$3x - 5x = 35$$

$$x = 17.5$$

$$\text{Berry (cherry)} = 6$$

$$\text{Total} = 17.5 \times 6 = 105$$

(b): Camera price = 200 \$
Discount = 25%
Tax = 6%

Camera Price after Discount = 150 \$
→ Tax = 6% of 150 \$
Total Amount to
paid = 150 \$ + 6% Tax (9 \$)
= 150 + 9
Total Amount = 159 \$.

(c) Bicycle covers = 36 km
Speed = 18 km/hr
Time = ?

$$\text{Speed} = \text{Distance} / \text{Time}$$
$$\text{Time} = \text{Distance} / \text{Speed}$$
$$= 36 \text{ km} / 18 \text{ km/hr}$$

$$\text{Time} = 2 \text{ hours}$$

(d) Unscramble the terms:

(i) STSTAICITS : STATISTICS

(ii) L4EBMAR : ALGEBRA

Q#7:

(a) Volume of sphere?

$D = 14 \text{ cm}$
 $\rightarrow \text{Radius} = \frac{D}{2} = \frac{14}{2} = 7 \text{ cm}$

$\text{Volume} = \frac{4}{3} \pi r^3 \rightarrow \frac{4}{3} \times \frac{22}{7} \times 7^3$
 $= \frac{4}{3} \times \frac{22}{7} \times 343$

Volume = 1437.33 cm³

(b) Smallest share

Total savings = 25000 RS

$\text{Ratio} = 1:2:2:3:4:5$
 $= 15$

$\text{Share} = \frac{25000}{15} = 1666 \rightarrow \text{smallest share}$

$15 \overline{) 25000}$
 $\underline{15}$
 10000

(c) Spot the error:

(i)

$2, 6, 18, 54, 162, 486$
 $\times 3, \times 3, \times 3, \times 3, \times 3$

Note:

No Error found
 All number fit as
 multiplier of 3 to
 next number

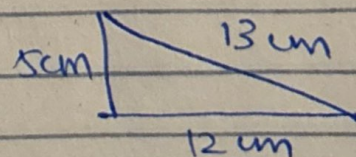
(ii)

3, 5, 7, 11, 13, 15. (complete the series)

(d) Triangle with sides (5, 12, 13) cm : Find angles?

$\sin A = \frac{\text{Per}}{\text{hyp}} = \frac{5}{13} \rightarrow A = \sin^{-1}\left(\frac{5}{13}\right)$

A = 22.6°



Right angle Δ

$$\cos B = \frac{\text{Base}}{\text{Hyp}} = \frac{12}{13}$$

$$B = \cos^{-1} \frac{12}{13} = 67.5^\circ$$

$$\tan C = \frac{\text{Per}}{\text{Base}}$$

$$C = \tan^{-1} \left(\frac{5}{12} \right)$$

$$\rightarrow C = 90^\circ$$

$$\rightarrow \begin{bmatrix} A = 22.6 \\ B = 67.5 \\ C = 90 \end{bmatrix} \text{ All angles are in degrees}$$

