

Jan-25

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General Science and Ability

Section - B

Qno:- 06
(A)

Data:-

Machine present cost = 8748

Depreciation rate = 10%

Price of Machine

3 years ago = ?

Sol:-

At the end of first year = $100\% - 10\% = 90\%$

At the end of 2nd year = $90\% - 10\% = 80\%$

At the end of 3rd year = $80\% - 10\% = 70\%$

So to calculate the cost of machine 3 years ago:-

$$8748 / 70 \times 100 = 12502 \text{ cfu.}$$

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(B)

Given:-

Father 4x of daughter

After 5 years = 3x of daughter

Further 5 years = how many times
of daughter = ?

Sol:-

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

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

$$\therefore x = 10 \text{ (daughter's age)}$$

$$\text{father's present age } 4(x) = 4(10) \\ = 40 \text{ years.}$$

After 10 years their age would be

$$\text{daughter} = 10 + 10 = 20 \text{ years}$$

$$\text{father} = 40 + 10 = 50 \text{ years}$$

So after further five years the father's
age would be 2 times of his
daughter. $5:2$

Am

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(C)

Data:-

Diameter of football = 2cm

Volume = ?

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

radius needs to be multiplied
by the and diameter with 2

$$R = 2 \times \text{radius}$$

$$\pi = 3.14$$

Sol:-

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

$$V = \frac{4}{3} \pi (1)^3$$

$$V = \frac{4}{3} \pi (216)$$

$$V = 288 \text{ cm}^3$$

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(d)

Data:-

Train 1 = 27 seconds

Train 2 = 17 seconds

pass each other = 32 seconds

Ratio of speed?

Sol:-

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

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

$$4x = 6y$$

$$2x = 3y$$

of x

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(4)

Data:-

Average of 7 consecutive number = 20
largest number = ?

Sol:-

$$7 \times 20 = 140$$

$$x + x + 1 + x + 2 + x + 3 + x + 4 + x + 5 + x + 6 + x = 140$$

$$7x + 21 = 140$$

$$7x = 140 - 21$$

$$7x = 119$$

$$x = 119 / 7$$

$$x = 17$$

now find the largest number
 $17 + 6 = 23$

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(B)

Aman → Bilal → Charlie is his
father's nephew

Aman is cousin of Dania but not
the brother of C.

Relation between D and C ?

Since Charlie is Aman's father's
nephew means Charlie (C) is a cousin
of Aman. Aman is also a cousin
of Dania but not brother of
Charlie (C). Hence Dania (D) is the
sister of Charlie and not the
brother.

~~The relation between C and D is
sister.~~

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(C)

(i) 4, 8, 96, 100, 180, 294, 448

(ii) 1, 2, 10, 37, 101, 125

$$2 \times 2 \times 2 = 8, 3 \times 3 \times 3 = 27, 4 \times 4 \times 4 = 64, 5 \times 5 \times 5 = 125$$

(iii) 11, 17, 39, 85, 163

$$11 + 3^2 - 3 = 17, 17 + 3^2 - 3 = 39, 39 + 7^2 - 3 = 85$$

$$85 + 9^2 - 3 = 163$$

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

$$+10 \quad +22 \quad +44 \quad 88$$

(v) 4, 12, 144, 400, 900, 1764

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(D)

Data:-

$$A : B = 1 : 2$$

$$B : C = 3 : 2$$

$$C : D = 3 : 4$$

Difference of share of A and D = 2240

Share of B in Rs = ?

Sol:-

	A	B	C	D
	1	2	2	2
	3	3	2	2
$\times 3$	<u>9</u>	<u>3</u>	<u>3</u>	<u>4</u>
	9	18	12	16

Let's assume A's share = $9x$ and D $16x$

$$(16x - 9x) = 2240$$

$$7x = 2240$$

$$x = \frac{2240}{7}$$

$$x = 320$$

now calculate B's share

$$Bx = 18x$$

$$B = 18 \times 320 = 5760 \text{ Rs}$$

Ans

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Qno:- 02

(A)

Igneous Rock	Metamorphic
1) Igneous rocks formed after the cooling and solidification of magma.	1) Metamorphic formed from the existing rocks due to high pressure.
Generally have crystalline texture with minerals intact.	Generally based on foliated or unfoliated texture.
Composed of minerals that crystallize as molten rock. e.g:- Mica, quartz	Composed of minerals that altered by heat and pressure e.g:- garnet
Igneous rocks mostly found under the earth's crust.	Found mainly in regions with tectonic activities, like mountain ranges.

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(B)

Smog:-

Smog is caused by air pollution that reduces the visibility by creating a hazy or foggy atmosphere. It is commonly observed in densely populated or industrial areas. The term was coined by Dr. Henry Antonio. Smog is a mixture of fog dust and air along with air pollutants such as nitric and volatile compounds.

Phenomenon of Smog:-

Phenomenon of smog occurs when the hazardous air mixture and air pollutants react with sunlight create a complex chemical reaction.

Types:-

Classical Smog:-

This type of smog is caused by the burning of coal and fossil fuels, producing large amount

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of Sulphur dioxide.

Characteristics:-

This type of smog consists of grey or black smog and usually appears in heavy industrial areas.

Photochemical smog:-

This type of smog commonly found in urban areas and it forms when sunlight reacts with pollutants like nitrogen oxides (NO_x) and volatile organic compounds (VOCs).

Characteristics:-

It is brown-hazy in color commonly observed in urban centers.

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(C)

Risk Assessment:-

Risk Assessment is a phenomenon / programme that helps in evaluating the circumstances and then measure it with the risk variables and provide a timely measure of how to reduce the consequence of any risk.

Benefits of Risk Assessment:-

- 1) Planning and organizing according to the prior data.
- 2) Information sharing to reduce the risk.
- 3) Timely and effective dissemination of information for effective response.
- 4) Evaluation to reduce the chance of destruction.

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Importance of Risk Assessment in Disaster Risk Management :-

1) Effective risk assessment reduces the chances of destruction.

2) It helps in risk-informed planning and strategies.

3) Risk assessment helps in timely preparedness for the disaster.

4) It helps in identify potential hazards.

5) Effective risk assessment helps in timely evacuating the people from the area prone to be damaged.

6) Collective effort with collaboration and strategic planning.

7) Minimize the cost of destruction by saving lives.

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(10)

7. Short-Sightedness (Myopia)

Short-Sightedness or myopia is a condition where distant objects cannot be seen clearly, while near objects can be seen clearly.

Causes:-

Myopia occurs when the eye ball is too long or the cornea (the transparent part of the eye) is too curved to reflect the distant object clearly.

Treatment:-

Short-sightedness is corrected by either glasses or contact lens. The concave lens usually correct the myopia by making the vision clear.

8. Far-Sightedness:-

Far-sightedness or hyperopia is the opposite condition of myopia. In hyperopia distant

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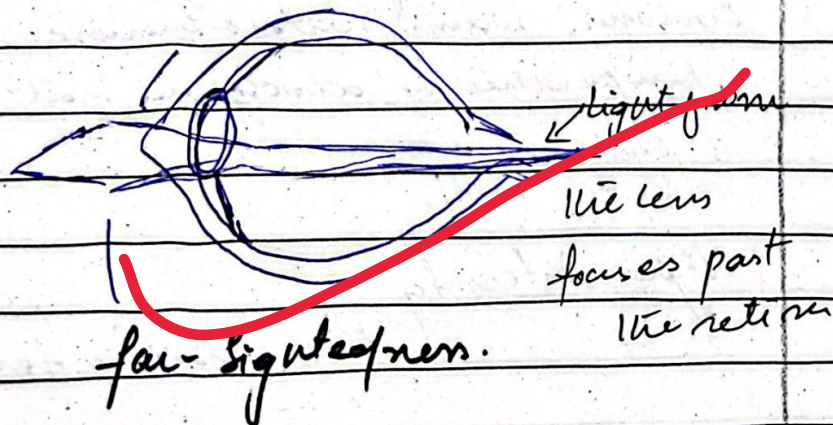
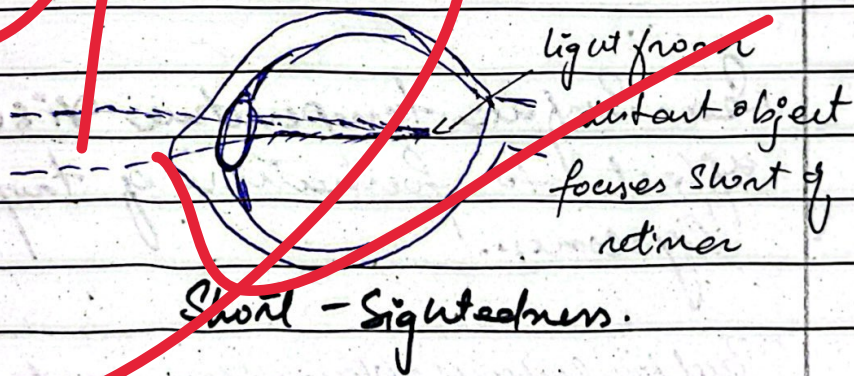
Object can be seen clearly but near objects cannot.

Causes: -

Hypertopia occurs when the eye-ball is too short or the cornea becomes too flat.

Treatment: -

Hypertopia is usually corrected with convex lens or lens. Sometimes surgery like LASIK can help correct it.



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Q no - 5

(A)

Sea Surface Temperature Rise:-

Sea surface temperature rise refers to the increase of temperature of the upper layer of the ocean, typically top surface. SST is a key factor in the climate change and it happens by the various natural and human interrelated factors.

Sea-Surface temperature rise affect to formation of tropical cyclones.

Fuel for cyclones:- warm ocean water is a crucial energy source for tropical cyclones. warm water increase the temperature of atmosphere that leads to cyclones.

Higher Intensity

Higher surface temperature

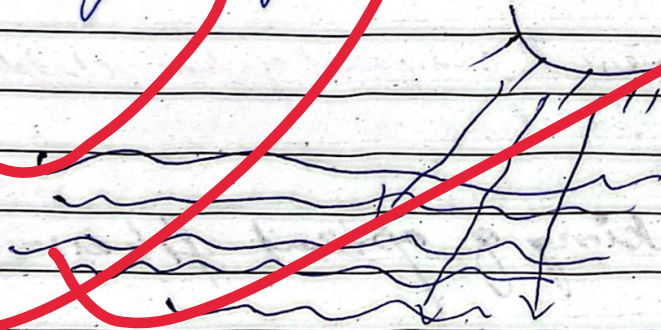
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Can lead to stronger cyclones. Warmer water provide more heat and pressure to the atmosphere for greater storm intensity.

Longer Duration:-

Warmer oceans may also support the longevity of the storms and tropical cyclones. Hence, the rising of surface sea temperature increases the chances of more and greater cyclones.



Heat shift the evaporation of the surface that leads to rising cyclones and storms.

(B)

Optical fiber:-

Optical fiber is a technology that uses light to transmit data over a long distance with minimal loss. It works on the principle of total internal reflection, which allows light to guide through a thin glass or plastic fiber.

Structure: It is composed of core, cladding and jacket.

Working of optical fiber:-

1- Transmission of light:-

Optical fiber transmits using light, the light is sent to the core of the optical fiber, which is the central part and core is usually made up of glass or plastic.

2- Reflection Inside the Core:-

When the light is injected into the fiber, it hits the core-cladding boundary of the fiber.

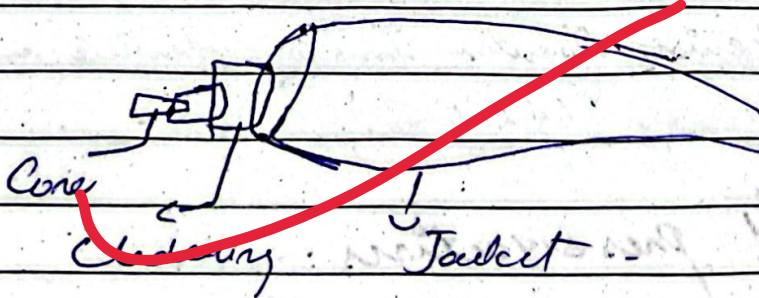
If the angle is steep enough, the light doesn't escape the core but bounces back and it happens due to the principle called total internal reflection.

Guiding over the distance:-

Due to the internal reflection principle the light easily gets travel through distance without interruption.

Receiving the signal:-

At the other end the light received by photo detector, which converts the light back into a electrical signal.



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(1)

1- Food Additives:-

Food additives are a substance that generally adds to enhance the value, pleasure or the nutrient of the food.

Types and purpose:-

- 1- Flavour enhancer:- Improve or enhance the taste of food (MSG)
- 2- Colorants:- Add or restore the color (food dyes)
- 3- Sweetener:- for sweeteners and flavour (Stevia)
- 4- Thickening Agents:- Improve texture and consistency (gelatin).

2- Food preservatives:-

Food preservatives are added to prevent or slow down the spoilage of food caused by microorganisms and anti-oxidants.

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Types and purpose:-

Antioxidants:-

These prevent oxidation
and rancidity (Scurvy fish)

Antimicrobials:-

To prevent the growth of
bacteria, mold or yeast in the food (Sodium
benzoate)

Acidulants:-

These preservatives prevent
to lower the PH levels of the foods to
prevent bacterial growth (Citric acid
and vinegar).

Use scientific terminologies

Scientific examples

Write all steps of maths

calculations

Content and paper presentation

are good

Keep relevancy

Keep length of all questions equal