

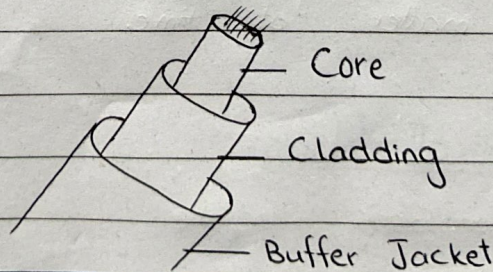
PART - II
SECTION - I

Q. NO. 2

(d)

Fibre Optics:-

Fibre optics is thin same as a strand of hair, very light-weighted, transmitting light from one place to another covering wide distances avoiding disruption.



⇒ How Optical fibres work:

The core and cladding made of glass and plastic. The light travels through the core minimizing the refraction as it is covered with a cladding that further protects it to get corrupt and to protect it from bending or straining, buffer jacket plays the role. The networks of thousands of optical fibres work in such a way, in which light travels from one end to another end and amplifiers on the ends further speeds up the process of receiving and transferring signals in a matter of time.

⇒ Uses of optical fibres:

- Computer networking
- Military defense applications
- Mobile phones
- Healthcare alliances
- Automotive Industry
- Mechanical Inspections

Q.No.2

(b)

Big Bang and Big Crunch:-

Big Bang and Big Crunch, both are the cyclical events of same cosmological phenomena of the universe.

In the Big Bang phase, energy is dissipated randomly and irregularly, it deals with the explanation of how the universe began. Whereas the Big Crunch theory says, the universe will stop expanding one day and then it will become smaller. As the universe shrinks, it will also get hotter. Everything that exists in the universe will collapse, taking it to a tiny point from where it all started. This process of expanding and shrinking, heating and cooling will occur in a cyclic manner.

→ Age of Universe:

The astronomers before 1999 estimated the

age of universe somewhere between 7 to 20 billion years. But with the advancement of technology and modern techniques it is now to be said near about 13.7 billion years.

We donot know if its exact or not. But the age of universe (cannot) can be determined in two ways:

a) By looking for the oldest stars

→ As many scientists and astronamers believed that all the stars in a globular cluster are formed at the same time, they can serve as clocks (cosmic).

b) The 'Hubble Constant'

→ By measuring the rate of expansion of

universe and extrapolating back to the Big-Bang

Q.No.3

(a) COP-28

⇒ Hurdles in Developing Countries to tackle the impacts of global warming:

According to Asian Development Bank, 2023 was the hottest year in the last 174 years. This rise in temperature leads to extremities such as flash floods, heavy rains, tsunamis, draughts

etc. And to these extremities the worst affectees are the developing countries like South Africa, Pakistan, Brazil, India etc.

Various factors contributes to the **challenges** faced by developing countries:

- They lack of proper infrastructure.
- Economic Crisis
- Famine, Food-Insecurity
- Already dealing with the after-maths of natural disasters.
- Humanitarian Crisis
- Lack of resources, technological advancements, and proper management.
- Ballooning of circular debts.

The developing countries are in the phase of developing, as according to COP-28, all the countries need to reach **Net-Zero Carbon** but it is to be done by developed countries first because the developing countries are not in the condition to do so for now but with the help of superpowers and **operationalization of Loss and Damage Fund (LDF)**, for the worst affectees by climate change, the developing countries can deal with the consequences of global warming.

QNO.3

Q_{NO. 3}

(b)

Balanced Diet :-

A balanced diet is the one which has all the basic and essential nutrients for a body to stay healthy, active, and energetic. A balanced diet should have nutrition of five major groups; Protein, Carbohydrates, Minerals, vitamins, and fibre. A diet which has these major nutrients in it will be considered as a balanced diet.

→ Components of a balanced diet :-

As a balanced diet

should comprises of nutrients from each major group. It can be consumed either from the natural sources or in the form of capsules.

- Protein → Meat, fish, Eggs etc
- Carbohydrates → Rice, Wheat etc
- Fibre → Green leafy vegetables, Barley, Cereals
- Vitamins → Fresh bright fruits
- Calcium → Milk, Beans, lentils
- Minerals → Dairy products, nuts etc

⇒ Balanced Amount of Each Nutrient:-

It is necessary to have a proportionate amount of each nutrient to maintain a healthy body

As consuming excessive amount or deficiency of other can lead to diseases such as malnutrition. Therefore, a balanced diet have all the nutrients in a proper amount as per the need of a person's body varying with his age, height, and weight.

QNO.4

(a)

SOLID WASTE Management :-

The process of collecting, transporting, and disposing

off the waste is basically known as solid waste management. This process is done in a proper manner in which the solid waste is firstly collected from different locations and then the next step is to gather it at one place, separating and analyzing the waste according to the category: **biodegradable** or **non-biodegradable**.

⇒ STEPS IN SOLID WASTE MANAGEMENT:

- (i) Firstly, the waste is collected from all the sources.
- (ii) Secondly, the **collected** waste is gathered at one place, specifically separated for the

waste management. There are different locations for the variety of wastes such as for the industrial waste which is hazardous for the environment as well as the human it is to be stored in a far away location.

(iii) The gathered waste will be **analyzed** and on the basis of its category it will be separated

(iv) The re-usable waste will be taken for the re-use, making it useful for different purposes.

(v) All the remaining waste is then managed by applying different methods to minimize the harm, after that with the use of heavy vehicles, rolling over the wheels again and again **layering** them to set in the soil, until its a smooth surface.

Q No. 4

(d)

(i) Uses of Microwave :-

- (a) The microwave rays are used for the satellite communications.
- (b) Microwave radiations are used in telephones, telephonic conversations.
- (c) It is used in the heating sources such as microwave oven.
- (d) It is used for the weather forecasting.
- (e) It is used for the fixed traffic cameras.

(ii) Uses of Ultraviolet :-

- (a) It is used in the aerosol sprays.
- (b) It is used in the refrigerator equipments
- (c) Creating Fluorescent Effects
- (d) It is used for killing bacteria.
- (e) It is used for a variety of purposes in industrial, household, and dental processes.

(iii) Uses of X-rays :-

- (a) It is used for detection and diagnosis.
- (b) X-rays are used in radiation therapy such as in the treatment of cancer.
- (c) It is used in the airport security.

(d) By penetrating in the soft-tissues of a human body it is used to detect joint fractures, inflammation etc.

Q NO.5

(a)

Different Methods of Food Preservation:

There are different methods for different kinds of foods to preserve them for a long-time. Some of the common methods, that are generally used on a larger scale are as follows:

(a) Freezing:-

The fruits and vegetables that are weather specific can be frozen for using it in the off-season or for a longer period of time, prevent spoilage of food.

(b) Salting:-

The use of salt like to store pickles, preserving it from the bacteria and fungus. It removes the microbes from the food.

(c) Semi-Cooked:-

The food items to stay fresh and to be used later can be semi-cooked or boiled in order to save them from rotting, extending its life.

(d) Air-Tight:-

To protect from the outside moisture, the

nuts, cereals are kept in a airtight jar to use it for a longer period, without reducing the taste

(e) Vacuum Packing:-

Drying out the food, removing all the air and storing it at a required temperature makes the food durable for a longer period.

(f) Sugaring:-

Jams, Jellies are all saved due to the process of sugaring as it has the property to stick with the food and to save it from setting, expanding its shelf-life.

Q NO. 5

(c)

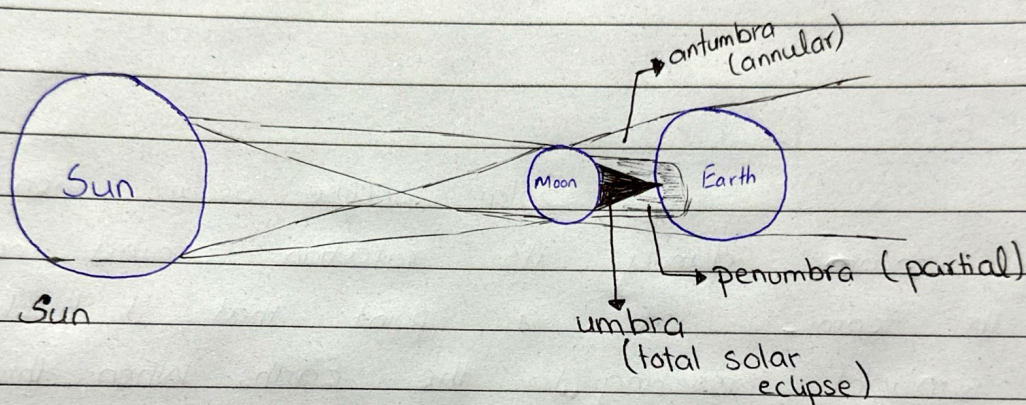
SOLAR ECLIPSE :-

Solar Eclipse occur when the moon during its rotation around the Earth comes at a point that it blocks the sunlight reaching to the Earth. When three of the celestial bodies align in the same line, it is called syzygy.

Types of Solar Eclipses :-

- (i) Total Solar Eclipse
- (ii) Partial Solar Eclipse
- (iii) Annular Solar Eclipse

(iv) Hybrid Solar Eclipse

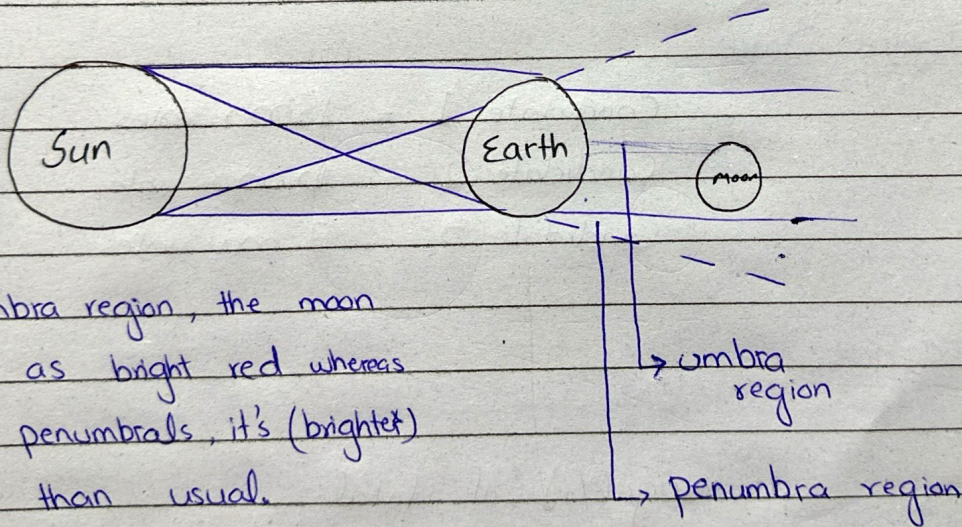


→ LUNAR ECLIPSE :-

Lunar Eclipse occurs when the sunlight gets blocked by the Earth and cannot reach the moon directly, making the moon red, brighter than usual, dark etc depending on the region in which the moon is.

⇒ Types of Lunar Eclipse:-

- (i) Total Lunar Eclipse
- (ii) Partial Lunar Eclipse
- (iii) Penumbral Lunar Eclipse



SECTION - II

Q. NO. 6

(a)

Given Data:

Candidate 1 = 15,000 votes

Candidate 2 = 10,000 votes

Candidate 3 = 8,000 votes

To Find:

percentage(%) of total
votes of winning candidate = ?

Solution:-

$$\begin{aligned}\text{Total votes} &= 15000 + 10000 + 8000 \\ &= 33,000\end{aligned}$$

% of total votes of winning candidate

$$\begin{aligned}\% &= \frac{15000}{33000} \times 100 \\ &= 45.45\end{aligned}$$

$$\boxed{\% = 45.4\%} \rightarrow \text{Ans}$$

Q No. 6

(c)

Given Data:-

Each group = 4 boys + 6 girls

No. of girls = 102

To Find:-

No. of boy = ?

Solution:-

Each group = 4 boys + 6 girls

No. of groups as per given data

$$\text{No. of groups} = \frac{102}{6} = 17 \text{ groups}$$

$$\boxed{\text{No. of groups} = 17 \text{ groups}}$$

$$\text{No. of boys} = 17 \times 4$$

$$\boxed{\text{No. of boys} = 68} \rightarrow \text{Ans}$$

Hence, 68 boys are required.

Q No. 7

(b)

Given Data:-

pentagon each side = 5 cm

To Find:

angles of perimeter
of regular pentagon = ?

Solution:

As we know,

regular pentagon = 5 sides = $5a$

Hence,

angles of perimeter = $5 \times 5a$

$$= 25a \rightarrow \text{Ans}$$

Q.No.7

(d)

Given Data:-

Avrg. age of 3 boys = 15 years
In ratio 3 : 5 : 7

To Find:-

Age of youngest = ?

Solution :-

As,

$$\text{Avrg} = \frac{\text{sum}}{n} = 15$$

Multiplying each by 3,

$$\text{Boy 1} = 3 \times 3 = 9$$

$$\text{Boy 2} = 3 \times 5 = \boxed{15}$$

$$\text{Boy 3} = 3 \times 7 = \boxed{21}$$

Hence,

$$\text{Age of the youngest} = \boxed{9} \text{ Ans}$$

Q NO. 8

(a) Given Data:-

Sum of 3 consecutive
odd no. = 273

To Find:-

three odd no. = ?

Solution:-

Let,

$x, x+2, x+4 \rightarrow$ odd numbers

$$\text{Sum} = 273$$

$$x + x + 2 + x + 4 = 273$$

$$3x + 6 = 273$$

$$3x = 273 - 6$$

$$x = 267/3$$

$$x = 89$$

Hence, three consecutive odd no. are **89, 91 and 93**.

Q no: 8

(c)

Solution :-

- (i) THRSI = SHIRT
 - (ii) GNDREA = DANGER
 - (iii) SCHAMOT = STOMACH
 - (iv) ONLDO = LONDON
 - (v) HIODALY = HOLIDAY
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