

Q. No. 7

- a. Average of 7-consecutive numbers is 20. Find the largest of these numbers.
- b. A told B that C is his father's nephew. D is A's cousin but not the brother of C. What relationship is there between D and C?
- c. Find the missing number in the sequence:
 - i. 4, 18, ___, 100, 180, 294, 448.
 - ii. 1, 2, 10, 37, 101, __.
 - iii. 11, 17, 39, 85, ____
 - iv. 13, 24, 46, 90, 178, ____.
 - v. 4, ___ 144, 400, 900, 1764
- d. A sum of money is to be distributed among A, B, C and D such that $A : B = 1 : 2$, $B : C = 3 : 2$, $C : D = 3 : 4$. If difference in the shares of A and D is 2240, then what is the share of B (in Rs)?

Q. No. 8

- a. Ali is standing 10 meters away from a tree. The distance of his eyes from his feet is 1.5 meter. Given that the distance from his eyes to the top of the tree is 15 meters, find the height of the tree.
- b. Find out the correct word from the jumbled spellings given below:
SONCCUOISIENT, EIVENPRRAOST, UORSIULDC, UNSPRESE, NMILAOPC.
- c. Draw and write the total number of lines of symmetry in a regular hexagon and octagon. How many lines of symmetry are there in a circle?
- d. If the base of the pyramid is rectangular having length is 7 cm and the width is 5 cm and the height of the pyramid is 10 cm, then find its volume.



SECTION B

QUESTION NO 6(c)

Given Data:

Diameter = 12cm

To Find =

Volume of a football

Formula of Volume:

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

First we will find radius

Formula	$r = \frac{d}{2}$	— (1)
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putting value of d in equation 1

$$r = \frac{12}{2} = 6$$

$r = 6$	— (2)
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now putting value of r in formula of volume:

$$V = \frac{4}{3} (3.14) (6)^3$$

$$V = \frac{4}{3} (3.14) (216)$$

$$V = \frac{4}{3} (678.2)$$

$$V = \frac{2712.8}{3}$$

$$V = 904.26 \text{ Answer}$$

20
18
2

Question NO 7 (c)

Find Missing Number

i- 4, 18, , 100, 180, 294, 448

ii 1, 2, 10, 37, 101, 226

Difference between 1 and 2 = 1

Difference between 2 and 10 = 8

difference between 10 and 37 = 27

difference between 37 and 101 = 64

Difference between 226 and 101 = 125

(1, 8, 27, 64, 125) = cubes series

iii- 11, 17, 39, 85, 163

(6 22 46 78) Differences that exists

- 16 24 32

Each number increases by 8.

PART-II
(SECTION-A)

Q. No. 2

- a. Differentiate b/w Igneous rocks & Metamorphic rocks.
- b. Explain the phenomenon of smog & give its types.
- c. Give the importance of Risk assessment in DRM.
- d. Explain short & far sightedness.

Q. No. 3

- a. What are the proteins & carbohydrates? Give their digestion.
- b. Explain the following:
Atmospheric pressure/temperature & humidity.
- c. Explain the ephemeron of Earth quake with diagrams.
- d. Explain the working of RADAR.

Q. No. 4

- a. Write a note on solar system.
- b. Give the importance of Pituitary gland.
- c. Differentiate RAM & ROM; also define the terms Nibble, USB and mother board.
- d. COP-29 targets to limit temperature rise upto 1.5°C. Comment.

Q. No. 5

- a. What is sea surface temperature rise? How does it affect the formation of tropical cyclones?
- b. How does optical fiber work?
- c. Discuss different ways in which micro-organisms can help in meeting the current fuel shortage.
- d. Briefly describe; Food additives & Food Preservatives.

(SECTION-B)

iv- 13, 24, 46, 90, 178, 35

11 22 44 88 176

Series is obtained by adding the same number.

v- 4, 144, 400, 900, 1764

256 500 864

QUESTION NO 3

(a)

Proteins:

These are most abundant organic compounds that are made up of Carbon, Hydrogen, Oxygen and Nitrogen. Sometimes it contains Sulphur as well.

Building Blocks:

Proteins made of amino acids which are building blocks of proteins.

Peptide Bond:

Amino acids are joined together with help of peptide bond.

Digestion of Proteins

In Stomach:

Digestion of proteins begins in stomach. HCl secreted by the parietal cells convert pepsinogen into **pepsin**. Pepsinogen is the inactive form.

Pepsin:

It break down - proteins into polypeptides.

Digestion In Small Intestine

Duodenum release enzyme known as Enterokinase.

Pancreatic Juice

It contains enzymes such as trypsinogen. Trypsinogen is the inactive form and enterokinase enzyme converts trypsinogen into trypsin.

Trypsin converts proteins into polypeptides.

Digestion in Jejunum

Jejunum release enzymes such as

- Amino peptidase
- Erypsin

Amino peptidase converts polypeptides into dipeptides. Erypsin converts dipeptides into amino acids.

Carbohydrates

These are organic compounds that are made of Carbon, hydrogen and Oxygen. They may be either ketonic or aldehydic.

Digestion In Oral Cavity

Partial digestion of carbohydrates takes place in oral cavity. Amylase converts carbohydrates into maltose.

Digestion In Small Intestine

Duodenum

Amylase converts starch into maltose.

Jejunum

Enzymes are present here that digests carbohydrates. Maltase converts

Starch into maltose and Lactase
converts lactose into glucose and galactose

QUESTION NO 3 (B)

Atmospheric Pressure

It is defined as force that is exerted by the air above a specific point in Earth's surface.

Units

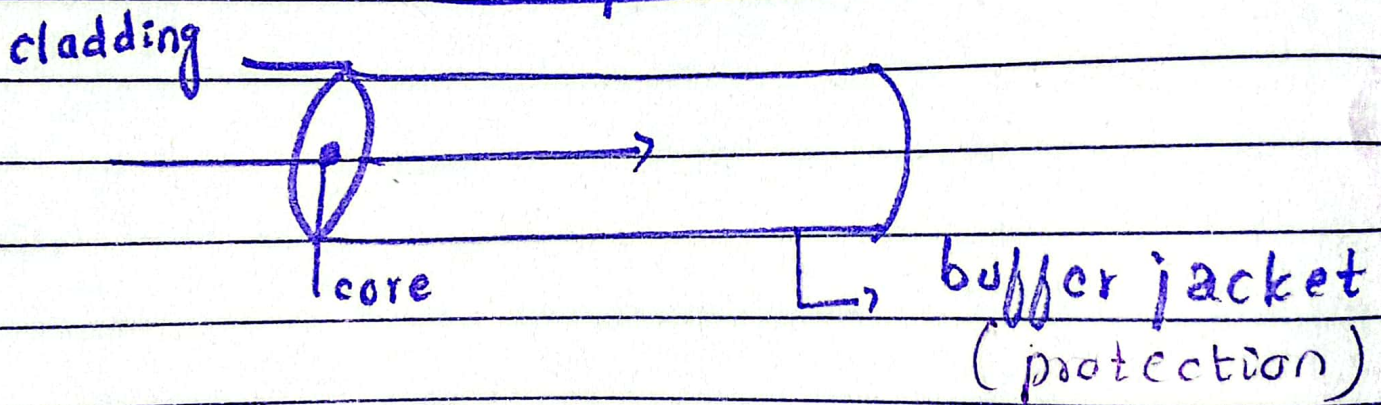
It is measured in units like Pascal, millibar, Psi, mmHg

QUESTION NO 5 (B)

Optical Fibres

These are strands of glass that carry light signal from one point to another in telecommunication.

Composition



Working

Total Internal Reflection

It works on the principle of total internal reflection. When light enters the core at specific angle, it is reflected

back into the core rather than escaping due to total internal reflection

Critical Angle

It is the angle of incidence at which angle of refraction becomes equal to 90° . After critical angle we achieve total internal reflection.

Transmitter

It converts the electric signals into light first that travels through the optical fibre. Transmitters such as LED is used.

Data Modulation

The light is modulated or turned on and off to represent data in binary code (1 and 0)

Optical Receiver

It receives the light and convert it back into electrical signal. Photodiode is used to convert light into electrical signals.

QUESTION NO 5 (a)

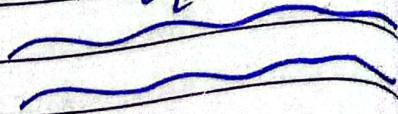
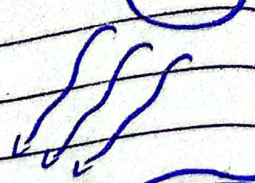
Sea Surface Temperature Rise

It refers to the heating of water bodies due to global warming. Global warming is increasing due to emission of green house gases like methane, CO_2 and CFCs.

Heat trapped inside
Earth Surface

Increase in temperature
of Sea

Sun



water body

How It Affects Formation of Cyclones.

Cyclones

It is a system of rotating winds around low pressure core due to pressure gradient, Coriolis effect and spin motion of earth.

Formation

For formation of cyclone water body must be there. Increasing sea temperature cause water to evaporate.

↑ temperature

↑ evaporation

Rising Air

When temperature will increase, evaporation and condensation takes place. The process of condensation will release heat. Due to heat the air will begin to rise because of less pressure. When pressure is less, air will rise due to heat.

In order to fill the low pressure zone, air will rush there and as air moves from area of high concentration

to the area of low concentration or pressure.

What Increasing Heat Is Doing:

→ Evaporation is increasing,

It is providing energy to the water molecules to convert into vapours.

→ Increasing Condensation:

The process of condensation is increasing due to heating of the surface of sea, and it releases more heat that helps in formation of cyclone.

→ Increasing Intensity of cyclone:

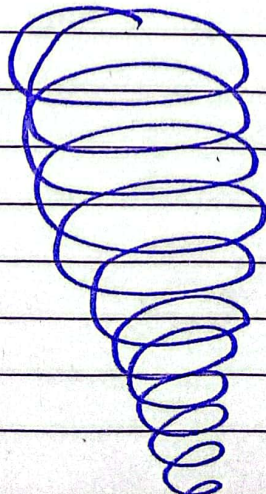
It is causing cyclones with more strong winds, heavy rainfall that is causing havoc.

→ Prolong Lifespan of Cyclone:

Cyclone over warmer waters, maintain their strength for longer period of time.

Example:

Hurricane Milton in Florida (2024).



Cyclone

QUESTION NO 5(D)

Food Preservatives

These are specific types of additives that is used to preserve the food or prevent food from being spoiled due to the activity of microorganisms.

- These usually inhibit the growth of microbes i.e bacteria, fungi.
- It extends the lifespan of food products.

Food Preservatives

Natural

Salt
Vinegar

Chemical

Sodium benzoate
Potassium sorbate

Uses

- Preserve the texture and flavour.
- Maintain the safety of food
- Inhibit growth of moulds, fungi etc

Example

In northern areas, meat is dried in sun and salt is applied to stop the growth of microbes.

Food Additives

These are substance that are added to the food products to enhance the flavour, texture, appearance and shelf life.

Uses

- Improves taste
- Enhanced visual appeal of food
- maintains the texture
- Enhance the flavour of food

Food Additives

Natural

Herbs

Vanilla

Spices (improve taste)

Turmeric (increase colour)

Artificial

• Monosodium glutamate

• Lecithin

QUESTION NO 5 (c)

Use of Microorganisms To Generate Fuel

Biomass

Energy generated from plants and animals is known as biomass. It is usually considered as garbage and include leaves, twigs, branches and dung of cows or buffalo.

Fermentation

In the generation of biomass certain methods are used and one of such methods is fermentation where microorganism are used to convert the biomass in biofuel.

Bioethanol

- Renewable fuel produced through the fermentation of sugars by microorganism
- **Yeast** is used for fermentation.
- It releases less green house gases as compared to others.

Biogas

- It is produced by anaerobic digestion of organic wastes by microorganisms.
- Organic matter is converted into CH_4 (methane) and (CO_2) .
- It is also used for heating, electric generation and vehicle fuel after purification.

Biohydrogen Production

- It is the use of microorganisms to generate hydrogen gas, which is much clean and renewable energy source.
- Anaerobic bacteria is used to break down organic substance to produce hydrogen.
- Hydrogen is used as power fuel cells for vehicles, and electricity.