

"General Science and Ability"

M T W T F S

DATE: 25/11/2023

Explain/What is CDM? write down its objectives?

(a) Clean Development Mechanism:

CDM is one of three mechanisms stated in the Kyoto protocol. The mechanism allows developed countries to play their part in reducing GHG emission.

Objectives of CDM

- To accomplish the overarching goals of the UNFCCC is to prevent dangerous interference with the climate system.
- To encourage sustainable development in developing nations.
- To reduce the cost of complying with the provisions of the Kyoto protocol for the developed nations.

Kyoto Protocol

Kyoto protocol is an international treaty made in 1992 to implement the objectives of the UNFCCC.

- Kyoto protocol binds the countries to reduce GHG (Green house Gases) emissions.

Reasons for criticism of the Kyoto Protocol by developed countries :-

- (1) Kyoto Protocol has been criticized by the US for exempting developing countries like China, India due to their huge emissions of GHG.
- (2) The level of GHG emissions at the time of the treaty and now has tremendously changed, but the targets have not changed.
- (3) GHG emissions know no boundaries. It is not confined to one country, but spreads in the whole environment.
- (4) Kyoto Protocol has not paid much attention to other pollutants such as
 - (a) Sulfur dioxide
 - (b) Nitrogen oxide.

Q1(b) Difference between Sanitary and industrial Landfills.

Sanitary Landfills

Industrial Landfills

- | | |
|--|--|
| (1) Sanitary Landfills are used for disposal of waste from homes and roads | (1) Industrial Landfills are used for deposition of industrial waste |
| (2) Methane is extracted | (2) Material reusable facilities, in which |
| (3) Layers of clay are used to separate the layers of waste | reusable items are extracted and sold. |
| (4) Pipelines are constructed to extract landfill gases | (3) No such layers are used. |
| | (4) No Pipelines connection are used. |

Q2: (c) Write a short note on Artificial Intelligence (AI)?

Definition of AI:-

"It is the study of intelligent machines capable of performing the same kinds of functions that characterize human thoughts."

Discovery of AI:-

- Artificial Intelligence term was presented by "John McCarthy" in 1956 at the Dartmouth Conference, Massachusetts Institute of Technology. (MIT)

Example:-

WABOT-2,

⇒ A robot developed by the "Wasefa University" in Japan in the 1980s. Utilized AI programs to play keyboard instruments, read sheet music and converse rudimentarily with people.

Two subsets under the term AI:-

- 1:- Machine Learning
- 2:- Deep Learning

Uses of AI:-

- (a) Financial Institutions
- (b) Scientists
- (c) Psychologists
- (d) Medical Practitioners
- (e) Design engineering
- (f) Security services

Advantages of AI:

- Smart Speakers and Digital assistants.
- Facial recognition.
- Deep Learning revolutionized services e.g.: Google Translate.
- Doctors assess and diagnose patients and their health risks with the help of AI.

Disadvantages of AI:

- Job Losses:
Machines in the replacement of humans can lead to large-scale unemployment.
- Human Error:
- No original creativity.
- High Cost.

Q2(b) Write short note on

Fibre Optics

Optical Fibre is the technology that is associated with the transmission of information as light pulses over a long distance along a glass tube, plastic wire or fibre.

Basic Structure of optical fibre

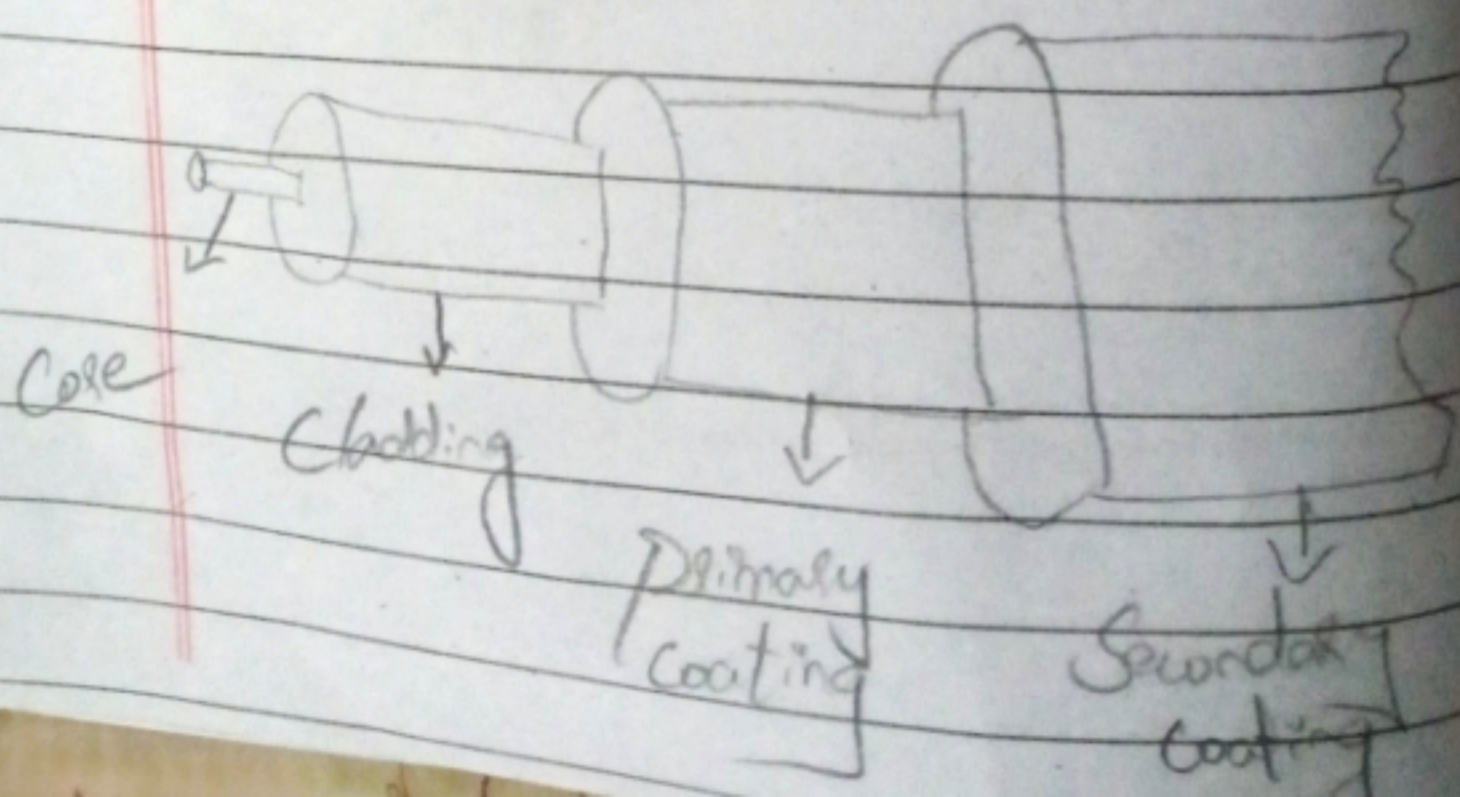
Optical Fibre consists of four (4) layers

- 1:- Core made up of glass
- 2:- Cladding made up of glass

Cladding:

is a reflective layer.

- 3:- Coating covers as a protective layer
- 4:- Jacket to bundle all fibres in one cable



Types of Optical Fibre

Main types of optical fibre are as follows:

Single-mode Optical Fibre

A fibre that is designed to carry a single signal at a time.

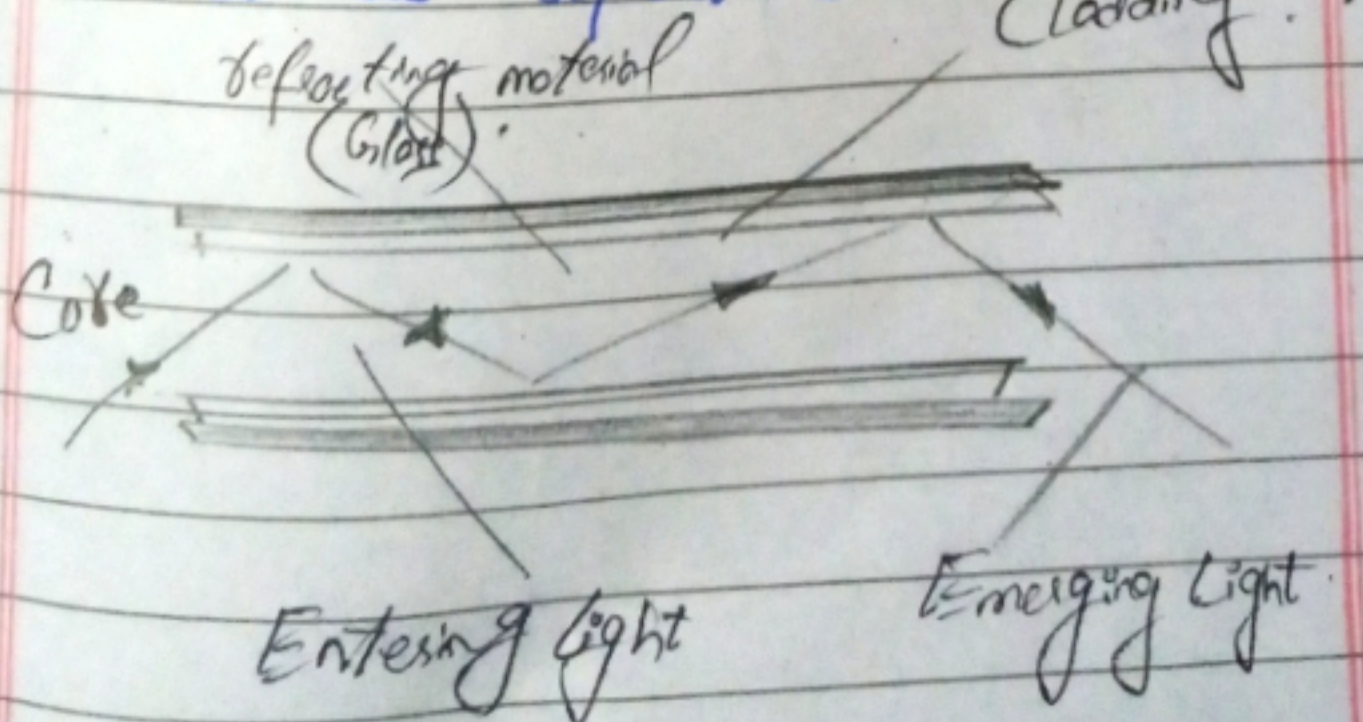
Multi-mode Optical Fibre

A fibre that is designed to carry more than one signal at a time.

Working of Optical Fibre:

=> In fibre-optic system, the transmitter turns information into light and sends it through optical fibres.

As light moves at a high speed through the core, light bounces off the cladding either by the phenomenon of total internal reflection (plastic) or continuous refraction.



Q2: Write a short note on

GPS:-

Global Positioning System

The GPS is a satellite-based Navigation System developed and operated by the US Department of Defense.

GPS is the shortened form of NAVSTAR GPS.

NAVSTAR =>

Navigation System with Time And Ranging.

GPS uses constellation of 24 Satellites to determine the accurate 3 dimensional position of the users on the earth.

Evolution of GPS

The GPS project was proposed in 1973 to overcome the limitations of earlier navigation system.

1st satellite was launched in 1978

but it became fully operational with launching 24 satellites in 1995.

Bradford Parkinson

Roger L. Easton

Ivan

are credited for their invention.

RUSSIAN'S \Rightarrow Global Navigation System Satellite (GLONASS)

EUROPEAN'S \Rightarrow Galileo Positioning System

INDIA'S \Rightarrow Indian Regional Navigation Satellite System

CHINA'S \Rightarrow Compass navigation system

But these systems are suffered from incomplete coverage of the globe and

Components of GPS:-

(I) Space Segment:-

- GPS Satellite Constellation composed of 24 operational Satellites in space

(II) Control Segment:-

- The control segment comprises of 5 ground station located on equator
- This information is sent back to the Satellites using ground antennas.

(III) Uses Segment:-

- The uses segment consists of all-path based GPS receivers.
- Totally uses community, both civilian and military

Q3: @ What is Tsunami? How the tsunami generated and What are their characteristics?

Tsunami :-

Tsunami is a Japanese word from a double root.

tsu => harbor,

namu => wave

Tsunamis are the ocean waves triggered by

a) Large Earthquake occurs near or under the ocean -

b) Volcanic eruption

c) Submarine landslides -

Tsunami waves are unlike typical ocean waves generated by winds and storms

Often the term, "Seismic or tidal sea wave" is used to describe the same phenomenon.

Generated of Tsunamis...

Tsunami can be generated by a giant meteor impact with the ocean.

These destructive surges of water are caused mostly by underwater earthquakes.

These underwater earthquakes, landslides or volcanic eruption can generate a tsunami by creating a sufficient force and violent movement of the earth.

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- This movement then causes a substantial and sudden displacement of a massive amount of water.

Characteristics of Tsunami:

- A Tsunami is one of the most powerful and destructive natural forces.
- It is a series of waves caused by a large and sudden displacement of the ocean.
- Tsunamis radiate outward in all directions from the disturbance and can move across entire ocean basins.
- Tsunamis are characterized by devastating waves that can cause widespread destruction and loss of life in coastal areas.

Q3 (b) What is an Earthquake? Discuss Richter Scale in the context. What was the intensity of earthquake in Pak dated 26-Oct-2015; where was the focus?

Earthquake :-

Earthquake is defined as: "Shaking and vibration at the surface of the earth resulting from underground movement along a **Fault** plane or from volcanic activity".

An **Earthquake** is the result of a sudden release of energy in the Earth's crust that creates **Seismic waves**.

Earth's crust is in constant motion because of tectonic forces.

Focus :-

"The actual place underground where the rocks break producing vibration is called the **Focus**".

Epicenter :-

The place on the surface directly above the focus is called the **Epicenter**.

Magnitude of an Earthquake:

Magnitude measures of energy released during earthquake.

There are several different ways to measure magnitude.

- Most common magnitude measure is **Richter magnitude** named for the renowned seismologist, **Charles Richter**.

Richter Scale is

- Minor Earthquake \Rightarrow 4
- Moderate Earthquake \Rightarrow 5
- Strong Earthquake \Rightarrow 6
- Major Earthquake \Rightarrow 7
- Great Earthquake \Rightarrow 8

Intensity of an Earthquake:

The intensity of an earthquake is measured by **modified Mercalli Scale**.

- It measures the energy released during the earthquake.
- The intensity scale takes into account the visible damage caused by the event.

General Knowledge

Founders of Various Scientific Field

1	Charles Darwin	Evolution
2	Gregor Mendel	Genetics
3	Hippocrates	Medicines
4	Galileo Galilei	Modern Science
5	John Dalton	Modern Atomic Theory

General Science

Important MCQ's

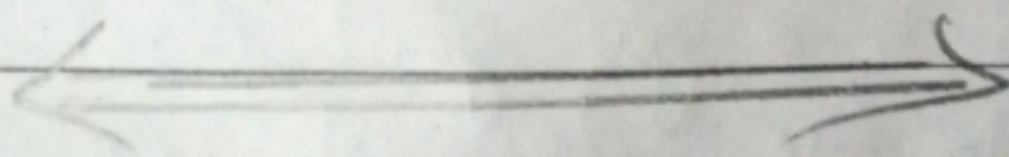
- The element required for solar energy conversion is **Silicon**.
- 1 metric ton is equal to 1000 kg.
- The substances human body produce to fight against disease germs are called **Antibodies**.
- Vitamin 'E' is present in **Wheat**.
- **Charles Louis Alphonse Laveran** discovered the Malaria parasite.
- **Joseph Lister** discovered antiseptic surgery.
- **Edward Teller** invented the **hydrogen bomb**.
- Urine of a diabetes patient contains more than average quantity of **Sugar**.
- A form of heart diseases in which blood supply to the heart is inadequate is known as **Angina**.
- Study of fingerprints is called **Dactylography**.

- Total volume of blood in a normal human being is 5-6 litres.
- A colour television set makes colours by mixing light of Blue, green and red colours.
- **Wood** is the least conductor of electricity.
- The red colour of the blood is due to the presence of a pigment known as **Haemoglobin**.
- **Lachrymal** glands secrete tears.
- **Tungsten** metal has the highest melting point.
- **Trachoma** is a disease of eye.
- Compressed Natural Gas (CNG) has the same chemical composition as that of **Sui Gas**.
- An ordinary mobile phone communication communicates by using **Radio waves**.
- An example of a hereditary disease is **Haemophilia**.

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- Black is not a primary colour
- Sound travel fastest through Steel
- Acid rain is caused by pollution in environment by Nitrous oxide and Sulphur dioxide -
- Arthritis name is given to inflammation of one or more joints
- The most malleable metal is Gold.
- The drug - Caffein, tannin and nicotine are Alkaloids -
- Sulphur is used in beauty parlours for hair setting -
- Radium is obtained from Uranium -
- Red Light is used in traffic signal because it has the longest wavelength and can be easily noticed from a long distance -
- Violent winds and rain are called Cyclones.
- Bronze is an alloy of Copper and Tin
- Normal heartbeat is 72 times in a minute.

- The term 'Bore' signifies to drill a well.
- Erosion is the process by which the surface of the earth is worn away.
- Skin is the largest organ of human body.
- Euclid revolutionized Geometry.
- Ornithology is the study of Birds.
- Acoustics is the science of sound.
- The art of breeding silkworm and production of silk is called Sericulture.



Jupiter Planet :-

Jupiter is the 5th planet from the Sun.

Largest planet in the solar system

Saturn Planet:-

Saturn is the 6th planet

from the Sun.

- It is the **2nd - Largest planet** in the solar system.
- Saturn orbits at a distance of about **886 mm** (1.4 billion km) from the Sun.
- Saturn takes about **10.7 hours** (no one knows precisely) to rotate on its axis once - a **Saturn "day"** - and **29 Earth years** to orbit the Sun.
- Saturn is a gas giant planet and therefore does not have a **Solid surface** like Earth's.
- Saturn's atmosphere is made up mostly of hydrogen (H_2) and helium (He).
- **Saturn** has **53 known moons** with an additional 29 moons awaiting confirmation of their discovery.
- Saturn has the most spectacular ring system with the **7 rings**, several gaps and division b/w them.

URANUS Planet:

Uranus is the **7th** planet from the Sun,

• It has the **3rd** largest diameter in our Solar System.

• It was the **1st** planet found with the aid of a **telescope**.

• Uranus was discovered in **1781**

by "Astronomer William Herschel"

• Uranus is about **4 times** wider than Earth.

• Uranus orbits at a distance of about **1.8 billion miles** (**2.9 billion km**) from the Sun.

• Uranus takes about **17 hours** to rotate once (a Uranian day) and about **84 Earth years** to complete an orbit of the Sun (a Uranian year).

• Uranus is an **ice giant**.

• Most of its mass is a hot, dense, fluid of "**icy**" materials — water, (i) Methane, (ii) Ammonia — above a small rocky core.

Solar Eclipse

Lunar Eclipse

- (1) When the moon comes between the sun and Earth, in between moon and sun the event calls solar eclipse. The event calls lunar eclipse.
- (2) The position needs to be like Sun-moon-Earth. The position needs to be like Sun-Earth-moon.
- (3) It occurs every 18 months. (3) It has course twice each year.
- (4) It occurs and stay for 5 to 7 minutes. (4) It can stay even for an hour.

Venus

Mercury

- | | |
|--|---|
| <p>(1) Venus is often called Earth's twin because they are similar size and structure.</p> <p>(2) Spinning in the opposite direction to most planet.</p> <p>(3) Venus is hottest planet.</p> <p>(4) Brightness object in the sky.</p> <p>(5) Venus is the 2nd closest planet to the sun.</p> <p>(6) Surface temperature on Venus are about 900°F.</p> <p>(7) Venus has 90 times the atmospheric pressure of Earth.</p> | <p>(1) The smallest planet in our solar system.</p> <p>(2) It is only slightly larger than Earth's moon nearest the sun.</p> <p>(3) Mercury's elliptical.</p> <p>(4) Mercury is the planet that orbits the closest to the sun.</p> <p>(5) Mercury is the fastest planet speed 29 miles (47 km) per second.</p> <p>(6) Shortest distance to travel around the sun (shortly as 88 years).</p> |
|--|---|

MCO's Based Notes

- Global warming is increased due to excess of **Carbon dioxide**.
- Kidney stones is caused due to **Calcium oxalate**.
- Diphtheria is a disease of **Throat**.
- Component of diet that prevent Constipation is **Fibre**.
- Etymology is a science of **Insects**.
- Uncharged particle in an atom is **Neutron**.
- Hemodialysis cleans the **Blood**.
- Sunlight is a good source of **Vitamin D**.
- A Hottest and Brightest Planet of Solar System is **Venus**.
- Blood is composed of **Plasma** and **Blood cells**.
- Blood is a type of **Connective Tissues**.
- Life span of **Red Blood cell** is **120 days**.
- The age of Solar System is **4.5 billion years**.

Blood Vessels that carries the blood away from heart into **Arteries**.

Paris is the capital of France situated on the bank of **Seine**.

Budapest is the capital of Hungary situated on the bank of **Danube**.

Agra is very famous city of India due to **Taj Mahal**, it is situated on the bank of river **Yamuna**.

Oxus River is flowing between **Afghanistan** and **Tajikistan**.

Yangtze Kiang river is located in **China**.

Yangtze Kiang is the largest river of **Asia**.

Mackenzie is the name of river located in **Canada**.

Orange is the name of river of **South Africa**.

Murray is the name of the river of **Australia**.

River Nile originates from **Lake Victoria**.

- **Liver** is the largest gland in the human body.
- **Stapes** is the smallest bone in the human body.
- **Human Cell** contains **46 Chromosomes**
- **Leukemia** is a **Blood disease**
- Idea of **Blood bank** was pioneered by "**Charles Richard Drew**".
- **Trachoma** is a disease of **Eye**.
- **ABO Blood Group** system was discovered by **Karl Landsteiner**.

Bacteria Diseases	Diseases caused by Virus
<p>Anthrax Diseases affected Lungs, Skin</p> <p>Tetanus Diseases affected Muscles (conv) or Spasms</p> <p>Tuberculosis (TB) affected the lungs, brain, spine</p>	<p>RABIES ⇒ Brain, Spinal cord.</p> <p>RNA ⇒ Paralysis</p>

Bacteria Diseases Caused

Gonorrhoea Disease	Affected Reproductive tract and Urinary tract.
Pneumonia Disease	Affected Lungs mostly alveoli.
Cholera Disease	Affected Small intestine.
Diphtheria Disease	Affected Respiratory tract Nose, Throat.