

QUESTION 1

PART A

GREEN HOUSE EFFECT IN CONTEXT OF GLOBAL WARMING

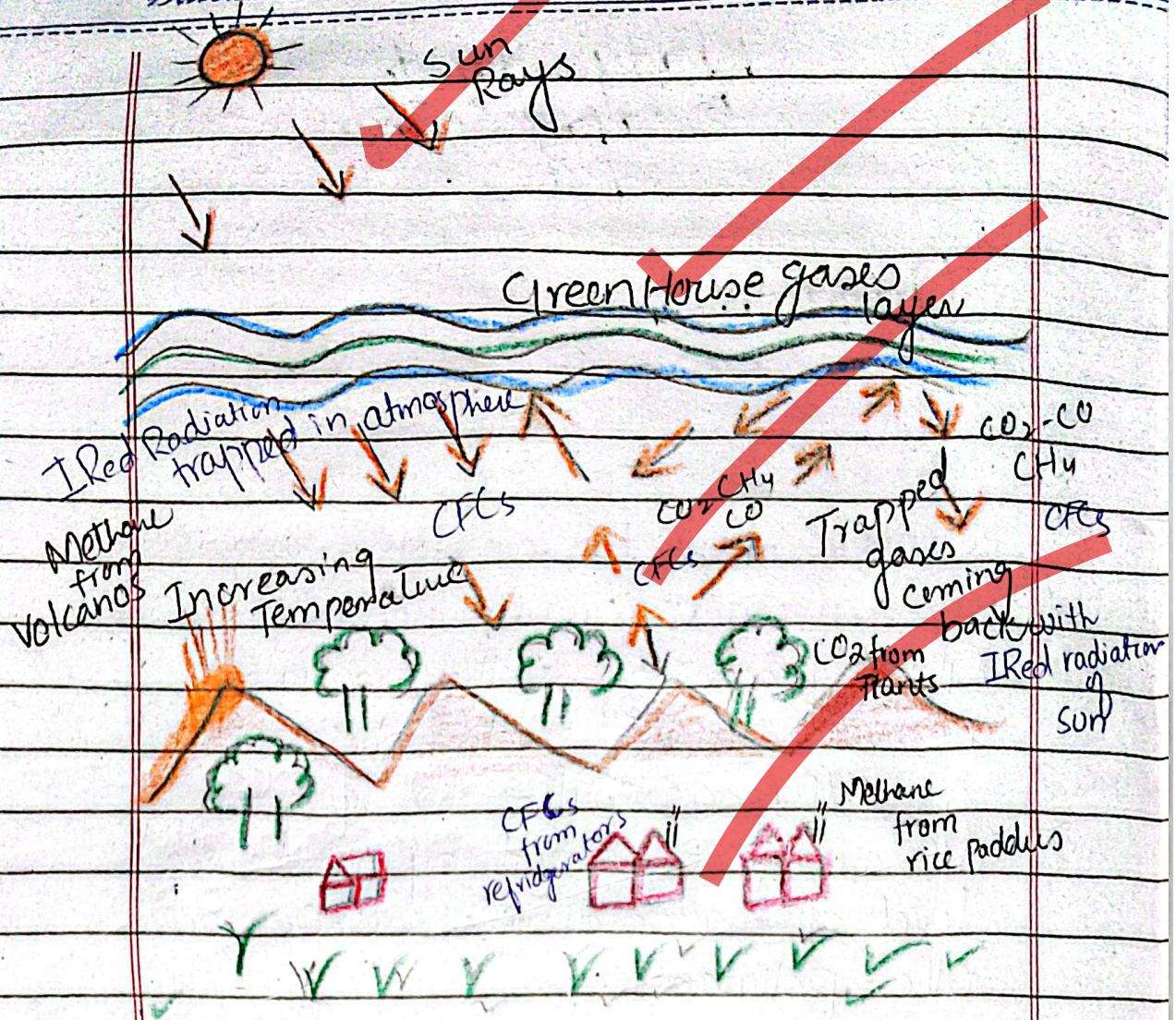
Global warming is the gradual increase in earth's atmosphere generally attributed to the green House Effect caused by increased level of carbondioxide, CFCs and other pollutants.

CAUSES OF Global Warming

- 1 The main cause of global warming is the release of **Green House Effect gases** i.e. Carbondioxide, CFCs, Carbmmonoxide gases.
- 2 Other causes of release of these gases are
 - Burning of fossile fuels
 - Fattle and rice paddies
 - Volcanism
 - Deforestation
 - The Artic Tundia releasing methane.

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(GREEN HOUSE) EFFECT

HOW GREEN HOUSE EFFECT WORKS AND INCREASE GLOBAL TEMPERATURE.

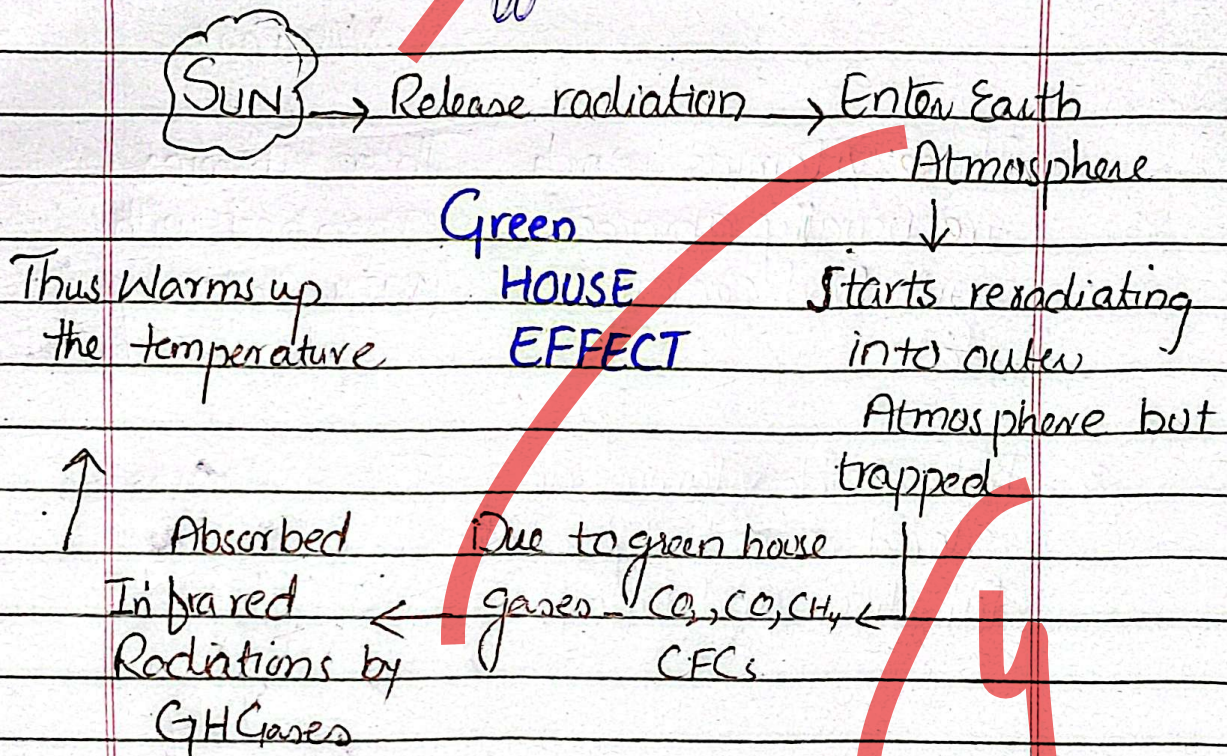
The burning of fossile fuels, volcanism, respiration of plants, Artic tundra Chloroflourocarbons from refrigerators release CO_2 , CO , CH_4 and CFCs in the atmosphere from an invisible layer -

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→ These gases absorb the infrared radiations coming from Sun and prevented it to reflect back in outer atmosphere.

→ The trapped infrared radiation, thus adds up in the warming of the Earth's atmosphere, known as Green House Effect.



PART B:

Vitamins:

Vitamins are organic molecules that are essential to an organism in small quantities for proper functioning of metabolic function.

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- 2 They are non synthesized in nature but can be obtained through consumptions.

Types of Vitamins:-

Vitamins are classified into two groups

Fat Soluable Vitamins

Water Soluable Vitamins

- | | | |
|---|---|---|
| 1 | Those vitamins which are usually absorbed with food containing fats. | Those vitamins absorbed with water containing food. |
| 2 | Fat-soluable vitamins are stored in the body's fat, liver and kidneys | These vitamins cannot be stored and rapidly leave the body in Urine |
| 3 | They cannot be taken regularly | They must be taken regularly |
| 4 | Examples:
Vitamin A, D, E, K | Vitamin
B, C |

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2 FUNCTIONS OF VITAMINS,

- 1 They act as a cofactor
- 2 They enhance the body's use of carbohydrate, proteins and fats
- 3 They are critical in the formation of
 - Blood cells
 - hormones
 - nervous system chemicals (neurotransmitter)
 - genetic material (DNA)

3 SOURCES AND DEFICIENCY:

Vitamins	SOURCES	DEFICIENCY
1 Vitamin A	Green Vegetables, milk, and milk products, eggs, carrot	Night blindness or complete blindness
2 Vitamin B	Meat, Milk, grains, eggs, liver, dairy products	Beri Beri, Pellagra, Fatigue, Depression, Inflammation
3 Vitamin C	Citric fruits, Green Vegetables, tomatoes	Scurvy
4 Vitamin D	Dairy products, eggs, liver oil and steroids	Rickets

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Vitamin E

Seeds, green
leafy Veges
and nuts

Sterility
Anemia

Vitamin K

Green leafy
Veges

Uncontrolled
bleeding.

PART C

The advancement in technology has given the world with a lots of things that has eased the life of a common man. One such technology is fiber optics, that has shown great miracles in the field of communication, medical and other general use.

1. Fiber Optics:

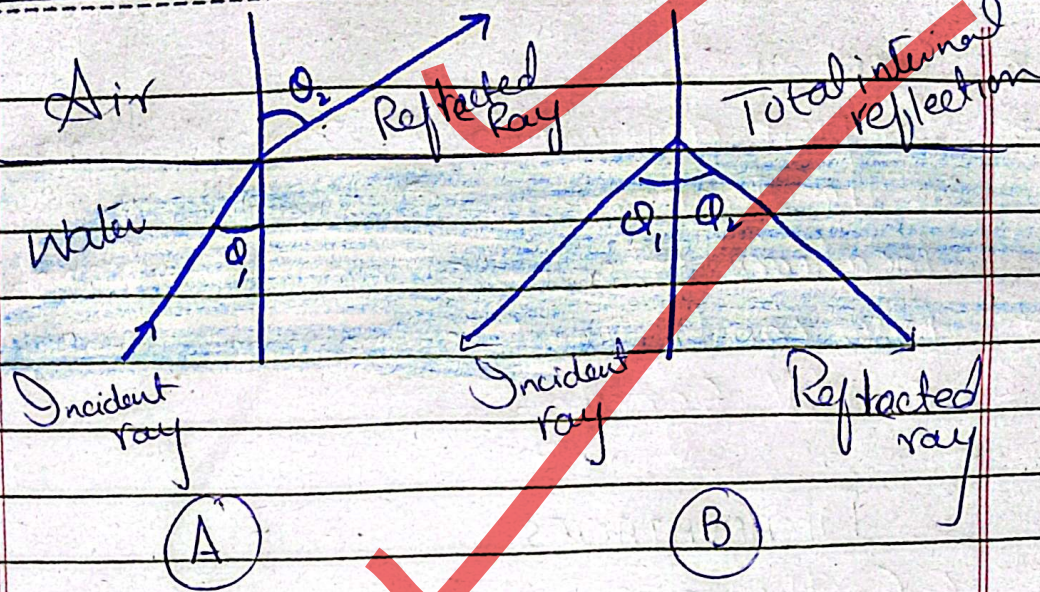
Fiber Optics refers to the technology associated with the Transmission of information with the help of light waves.

* PRINCIPLE OF FIBER OPTICS.

Fiber optics works on the principle of total internal reflection, that keeps the light inside the pipe.

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Total internal Reflection:

When incident ray's angle is equal to the angle of reflection.

2 IMPORTANCE OF FIBER OPTICS.

In today's modern world, fiber optics are of great importance. Their importance is explained ~~under~~ through advantages and disadvantages of Fiber optics.

Advantages:-

1- Telecommunication

Optic fiber transmit energy in form of light and is heard in form of sound through telecommunication optic cables.

2 Medical Use

With its thin, flexible strands, fiber optics can easily be inserted into the blood vessels, lungs and other hollow parts of body.

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3. General Use

- Simplest application of optical fibers is the transmission of light to locations otherwise hard to reach.
- Also can be used to transmit images or TV signals.

DISADVANTAGES

- 1- Costly in nature.
- 2- Fragile and fear of breakage.
3. Require more protection compared to copper cables.

CONCLUSION

In sum, Optical fibers are the great technological advancement in field of science till date, that helps in communication to far flung areas. However, the cost and its fragility is making it hard to be use by a common man.

PART D

Anything that is harmful for the environment is known as pollution. Nowadays, Earth has different types of pollution - land pollution is harming the soil and very beauty

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of environment, while Air pollution is harming the atmosphere. One of the injurious form of pollution is Water pollution, which is directly endangering the very life on earth.

WATER POLLUTION:-

Water pollution refers to the contamination of water bodies with toxic, chemical discharge of pollutants directly or indirectly without adequate treatment to remove harmful compounds.

"Water is Life"

"Ban Ki-moon", the former UN general Secretary has referred water as life, thus polluting water means life is threatening on earth.

Types OF WATER POLLUTION:-

Three types of water pollution are explained so far

① SURFACE WATER POLLUTION:-

Pollution that is caused by domestic unsatisfactory sanitation system, agricultural runoffs and by industrial effluents, polluting the surface water is known as surface water pollution.

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2 OCEANIC WATER POLLUTION

Pollution that is caused by oil spills of ships, throwing of plastics, medical waste and Disposal of sewage in Oceanic bodies is known as Oceanic water pollution.

3 GROUND WATER POLLUTION

Ground water is an important source of drinking water - Ground water pollution is caused by common pollutants like Cl^- , NO_3^- , heavy metals and petroleum etc.

3 SOURCES OR CAUSES OF WATER POLLUTION:

The sources of water pollution are:

- 1 Incomplete treatment of Sewage
- 2 Oil spills of trade ships
- 3 Insecticides and Herbicides
- 4 Chemical fertilizers
- 5 Radioactive materials
- 6 Industrial Effluents
- 7 Thermal pollution

4. CONTROLLING MEASURES FOR WATER POLLUTION:

- 1 Sewage treatment plants should be installed.
- 2 After treatment, the sewage waste should be dumped.
- 3 Treatment of Industrial waste.
- 4 Industries should be established away from population and rivers.
- 5 Ban on nuclear dumping in Oceans.
- 6 Introduction of Oil Zappers in Oceans in order to prevent from oil spills polluted water.

Conclusion:

In sum, Water pollution is harmful to life, therefore all its types and sources should be treated on priority bases.

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QUESTION # 02

DEFINE:

1. FOOD PRESERVATIVES

Food preservatives are the substances that are added to food in order to extend the life of food by keeping them safe from spoilage, microbial growth, oxidation and rancidity.

Common preservative used are:

- | | |
|---------------|--------------------|
| ① Vinegar | ⑤ Mustard seed |
| ② Citric acid | ⑥ Cumin seeds etc. |
| ③ Turmeric | |
| ④ Cinnamon | |

2. FOOD ADDITIVES.

Food additives are substances that are intentionally added to the food or animal feed during processing or storage.

They include preservatives, Flavouring agents, Colouring agent, Antioxidants, thickening agent or stabilizers.

3 FOOD ADULTERATION:

Food adulteration is the process or act of intentionally debasing the quality of food offered for sale either by substitution of inferior substances or by the removal of some valuable ingredients.

Common types include:

- poisonous substance inclusion
- Microbial contamination
- Accidental contamination
- Economic Adulteration

4 FOOD CONTAMINATION:-

Food contamination is the presence of harmful toxic chemicals and pathogens in food products, that can cause illness or disease in human beings.

Common food contamination includes:

- Addition of sand, stone, mud, water etc
- Presence of pesticide residue.
- Germs on hand.
- Raw meat etc.

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PART B

Anthropogenic activities are responsible for nearly half of the problems on earth. One such problem is air pollution.

1 HUMAN ACTIVITIES DETERIORATED ATMOSPHERIC CONDITION:

The atmospheric condition is deteriorated by many factors involving both natural (volcanoes, Forest Fires, Winds storms, live plants and Decaying plants) and Anthropogenic sources.

Air pollution is one of the most dangerous and common phenomena of recent era, that has endangered the lives of people. Human activity is the ultimate cause of air pollution. Since Science has evolved technologies and it helped in the human welfare, In this process, pollution has been the part of technology and therefore, a part of human miseries.

The common sources are

1 OVER USE OF AUTOMOBILES

Carbonoxide is produced during incomplete Combustion that is the major pollutant generally emitted from vehicles.

2 ELECTRIC POWER PLANT

Electric powerplants produce electricity and for energy production fossil fuel is burned that releases SO_2 gases, harmful for air.

3 EXHAUST FROM FACTORIES AND INDUSTRIES

Manufacturing industries also release large amount of CO , HC , organic compounds and chemicals into air - thereby depleting the quality of air.

4 INDOOR CLEANING PRODUCTS & AIR POLLUTION

House hold cleaning product, painting supplies emit toxic chemicals in air and cause pollution.

5 SUSPENDED PARTICULATE MATTERS

Suspended particulate matters afloat in the air, caused by dust and ~~ex~~ combustion and leads to smog.

2 EFFECTS OF AIR POLLUTION:-

- 1- Causes diseases including Bronchitis, Asthma and Lung Cancer
- 2- Reinforces global warming
- 3- Causes Acid rains
- 4- Depletion of Ozone layer
- 5- Causes Wild fires.

3 CONTROLLING MEASURES:

Pollution prevention is a key element for a sustainable society. - It can be managed by following measures.

1 USE OF PUBLIC MODE OF TRANSPORTATION:

Government should produce effective public transport and people should be encouraged to use it.

2 ENERGY CONSERVATION

Energy should be conserved - No extra lights and fans should be open without use - Also one should reduce the number of fossil fuel burns.

3 CLEAN ENERGY RESOURCES USE

One should be emphasis on clean energy resources like solar, wind and geothermal to curb air pollution.

4 PLANTATION FOR CLEAN AIR

More and more plants should be grown to acquire safe and clean air.

5 USE OF ENERGY EFFICIENT DEVICES:

Energy efficient devices should be used (like Compact Fluorescent lights (CFL) lights. They consume less energy as against its other counterparts.

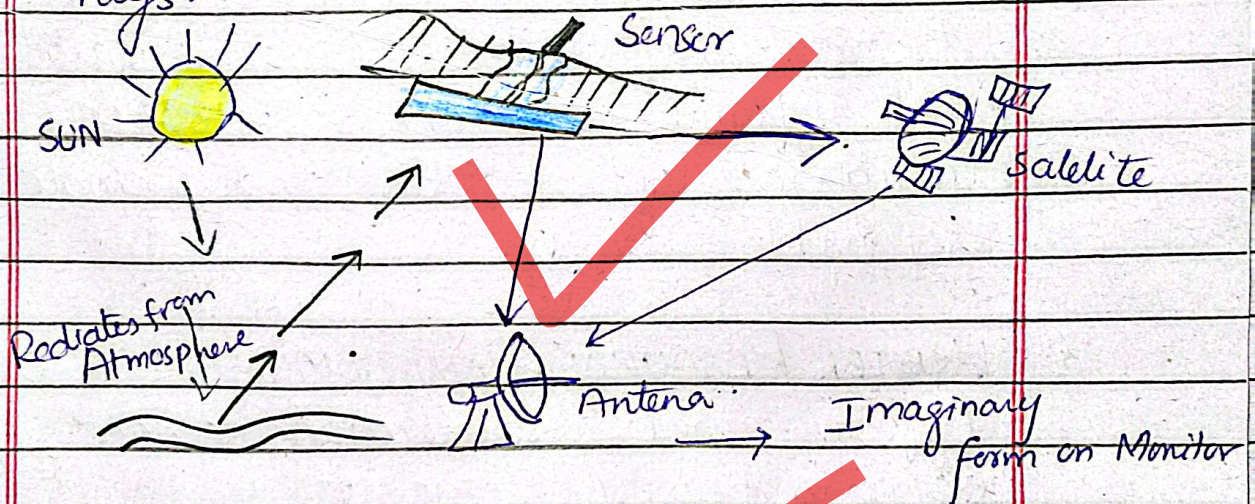
1 PART C: REMOTE SENSING:-

Remote sensing is a ~~typ~~ science of obtaining information about objects or areas from a distance, typically from aircrafts.

HOW IT WORKS:

Remote sensors collect data by detecting the energy that is reflected from Earth. These sensors are mounted either on satellite or on aircraft.

* The energy is mostly the Sun rays.



2 HOW REMOTE SENSING HELP IN ENVIRONMENTAL SCIENCE.

- 1 Facilitates in the study of various earth's surface features in spatial relation to other bodies.

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2. Climate Change Analysis

Remote sensing plays a crucial role in understanding climate change by offering continuous high resolution data on temperature variations, green house gas emissions, and ice sheet dynamics. It also helps in analyzing extreme weather events such as hurricanes and heat waves.

3. DEFORESTATION AND LAND USE CHANGES

Remote sensing technologies are essential for monitoring deforestation and land use changes. Comparing historical data with recent data enables the quantification of forest loss, the evaluation of urban degradation - expansion. Satellite data, thus informs governance efforts to mitigate deforestation and promote responsible land use.

3. WATER RESOURCE MANAGEMENT

Effective water resource management depends heavily on accurate and timely data, and remote sensing provides critical information about global water dynamics. - Satellite sensors monitor precipitation, river flows, and groundwater levels, enables better management of freshwater supplies. - It also helps

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identify pollutants in aquatic bodies allowing intervention to improve water quality. - Moreover, it will also give timely data on glacier retreat, soil moisture and crop water requirements.

4 DISASTER MANAGEMENT AND MITIGATION

Remote sensing is instrumental in all phases of disaster management - preparedness, response, and recovery. Timely tracking of natural hazards will be done through this process. Thermal sensors detect wildfire breaks, allowing for prompt intervention. - In this way proactive risk mitigation plans can be enacted before disasters.

PART D RADAR:

RADAR stands for Radio Detection and ranging.

It was invented during second World war.

" Radar is an instrument work on the principle of radiowaves to range the things like ships, planes and help in communication and detecting weather scenarios: "

WORKING OF RADAR.

Parts include

1. Transmitter
2. Receiver
3. Indicating devices
4. Antenna

1. Generation of electromagnetic waves (above 600 MHz) by transmitter.
2. With the help of ^{concave} antenna the waves are send out in any direction in cone shaped beam.
3. With the velocity of light these ways hit any object ~~is~~ coming its way.
4. After reflection these waves strikes the radar antenna and amplified in radar receiver.
5. Receiver send signals to the indicating devices which measure the time taken by the radar waves to strike the object and come back.
6. By knowing the wave velocity, The distance of the object from radar is found.

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