(SUBJECTIVE PART)
SECTION-I (SCIENCE)

Note: Attempt any two (2) questions. All questions carry equal marks. (5x4 = 20 marks)

Question 1:

A) What is the relationship between volcanoes and earthquakes?
B) What is WildFire? How do wildfires impact the environment?
C) What are the methods of food adulteration?
D) Are biofuels the solution to the impending energy crisis?

Question 2:

A) What is eutrophication, what causes it and what are the dangers?
B) What is acid rain and how does it develop?
C) What is water pollution? Where does water pollution come from?
D) What are the three major classes of rocks?

Question 3:

A) What do you know about fibre optic cables?
B) What is a light-emitting diode?
C) How many types of cyclones are there? Explain.
D) What is an antioxidant? What do antioxidants do?

Signature of Manager/Principal

SECTION - I

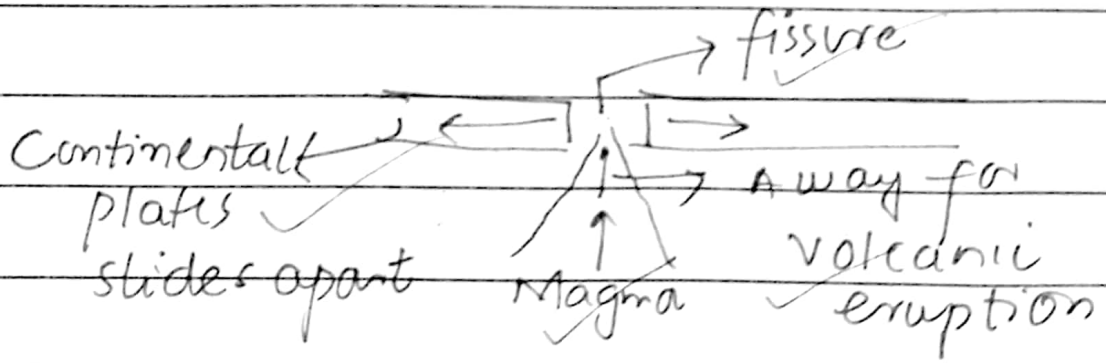
Q No. 1

Ans:

Relationship between volcanoes earthquakes:

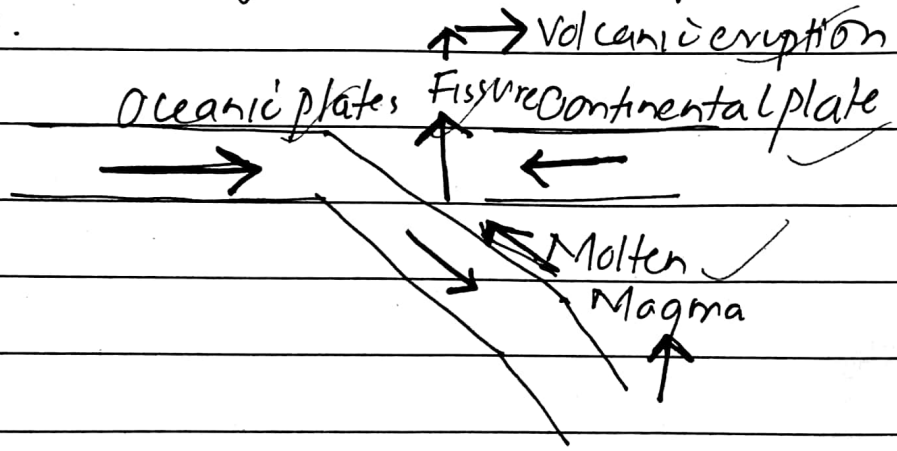
Introduction:

Earthquake is the sudden shaking, movement of tectonic plates inducing vibration and causing huge economic, soci eco-system Loss. The Movement of divergant plates, the slides past of plates create a fissure, rupture that create space for volcanic eruption on the earth.



④ Sometimes the divergence of plates also creates pressure on the molten magma or rock to erupt on the earth creating violent volcanic eruption.

⑤ Subduction zone created as once oceanic plates submerged beneath the other continental plates. If molten rocks are present in subduction zone that subducting movement can also pushes the volcanic magma to be erupted through faults.



Conclusion:

Hence, the shaking of earth surface, movement of plates in divergence and formation of subduction can create a way for volcano or molten magma to be erupted creating huge vent of volcanic fragments on earth.

Part (B)

Ans:

Wildfires and its impact on environment

Introduction:

Wildfires' Defination:

Wildfire is the sudden spread of violent fire on the forest causing huge burn out of forest and biodiversity loss.

Causes:

Wildfire may be caused due to

- Extreme temperature resulting into wildfire
- Poorly controlled burning of agricultural waste resulted into widespread of fire
- For ~~irr~~ cultivation purposes, burning of forest resulted into wildfire.

Impacts of Wildfire on environment

1) Combustion of organic waste along with wood resulted into high Carbon dioxide emission into atmosphere.
2) Incomplete combustion of partly

dried wood and incombustible inorganic waste resulted into vast emission of smoke which is dangerous for respiration of species., can also cause smog.

3) Incomplete combustion may produce other dangerous gases including carbon monoxide, compounds of nitrogen oxides, carbides etc.

4) Wildfire may increase the temperature

5) Wildfire may change the entire landscape ~~creating~~ making it unsuitable for species to live, causing vast migration of species.

6) Wildfire may killed vast number of animals, plants, trees, creating a huge loss to essential foodchain of animals and human.

7) As forest is totally evaded from land due to wildfire, the oxygen might be depleted causing respiratory issues.

8) Wildfire create a way for smooth flooding as there are no trees to

Chap/Test No: _____ Date: _____

Q. No.	1	2	3	4	5	6	7	8	9
Marks Obt.									

Signature of Teacher | Signature of Manager/Principal | Signature of QCD/Std. Counsl.

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to create hurdle in the way of floods.

Conclusion:

Thus, wildfire created or resulted from intentional or unintentional reasons may create a huge loss to ecosystem.

Part D.

Biofuels solution to the impending energy crisis:

Introduction:

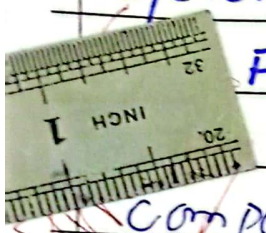
Due to overpopulation and wide consumption of fossil fuels and limited source availability of fossil fuel have created a huge demand to look for alternate energy sources. Biofuel is considered to be an alternate sorce to meet the energy demand. As its production is totally based on organic and renewable

source, so it is aviable option to meet the energy crisis. Whereas like everypossible things, there is certain limitation to in its usuage as well.

Production of Biofuel:

Animal fat (oilseeds, crops) + Alcohol (Methanol / Ethanol) ⟶ Biofuel (Biodiesel, BioOil etc) + glycerine

Generations of Biofuel:



First Generation:

The production of Biofuel from organic compounds more specifically animal fats ~~extracted from~~ (oils or fats) extracted from seeds, crops (wheat) and alcohols derived from plants (ethanol) resulted into providing's alternate source of energy. Along with that it has also created a concern for food shortage as large range of food crops would be utilized in the production of biofuel, creating food shortage.

2) Second Generation:

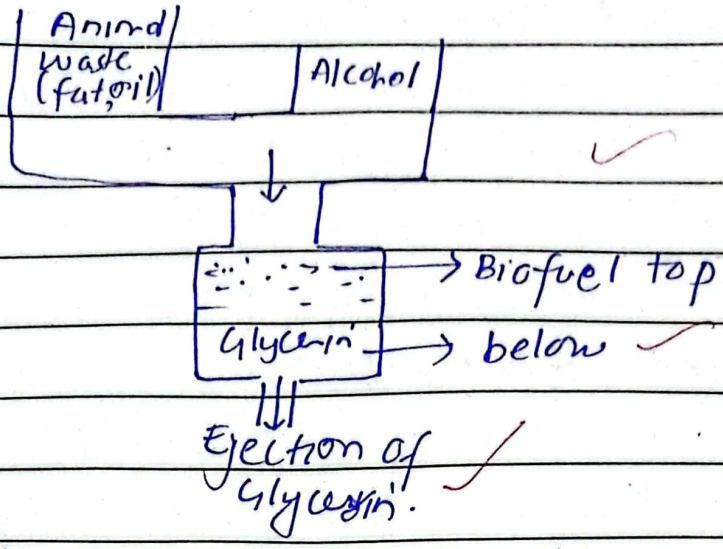
To overcome the first generation issues, the biofuel is generated from "wastes" i-e animal wastes, crops wastes, the scrap of foods.

3) Third Generation:

To make it more viable solution for economic or net gain, algae is considered to be essential resource for production of biofuel. Also algae can be grown in vast amount and even on turbid or impure water or waste. Thus, it is a economic step towards biofuel production.

4) Fourth Generation:

Fourth generation of production of biofuel is involved with producing things such process which not only remove waste or a source of energy but also reduce Carbon dioxide as the process of production involves the huge emission of CO_2. Thus, organic material is produced on such environment which absorb carbon dioxide and can be utilized in production of biofuel thus reducing C-level.



Production of Biofuel (Biodiesel)

Criticism to Biofuel usuage as source of energy:

1) produce huge CO_2 emission
2) Food shortage
3) produce low voltage of energy.
4) Wide raw material is required for production of small amount of biofuel.

Conclusion:

Thus, Biofuel is an alternate source to meet energy crisis, but Carbon dioxide emission and low energy production, food shortage concern limit this effecient usuage. But, with technol usuage, it can be make viable.

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Qno. 3

Part (a)

Fibre Optic Cables:

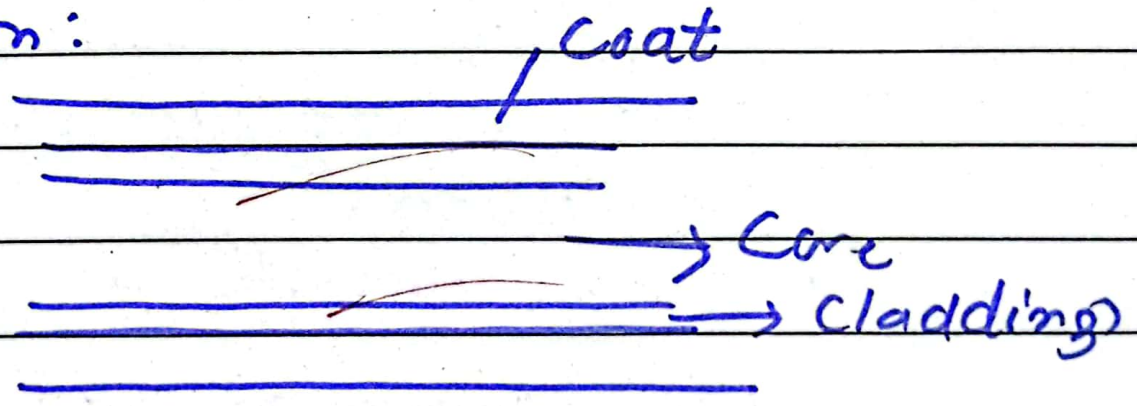
Fibre optic cables are thin glass cables used for transmission of signals through light transmission using the phenomena of total internal reflection.

Composition of Optic fibres:

Fibre optic is composed of inner core, outer cladding and outer protective coating.

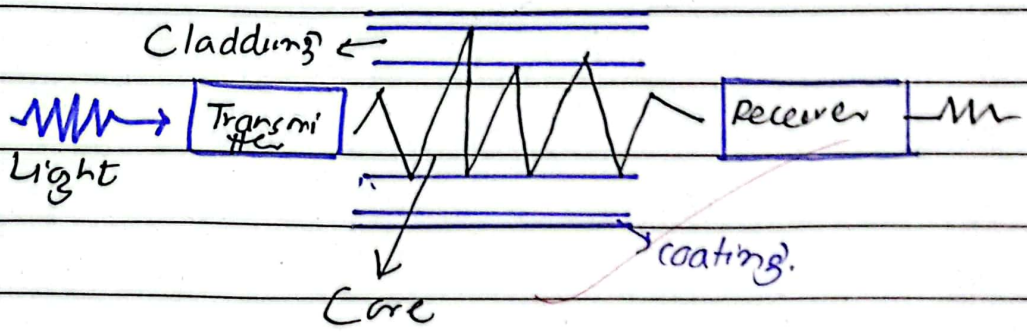
1. Core
2. Cladding
3. Coating

Diagram:



How fibre optics work:

Fibre optics works through the phenomena of total internal reflection. As the light enters the glass core it is strikes to the inner core while some strike to outer cladding this difference in refractive indices of core and cladding cause the light to bend towards its normal - causing total internal reflection.



Application:

Fibre optics is used because it is

① light in weight as compared to copper wires

① It is carries vast data transmission.

① Minimum loss of data from its transmission

① provide transmission over a large distance.

Part (B)

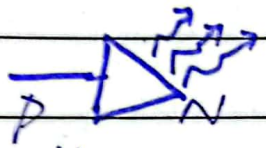
Light-emitting diode:

Definition:

Light emitting diodes are photovoltaic cells that functions only when forward biased.

They are of two types

1) N-type cells
2) P-type cells



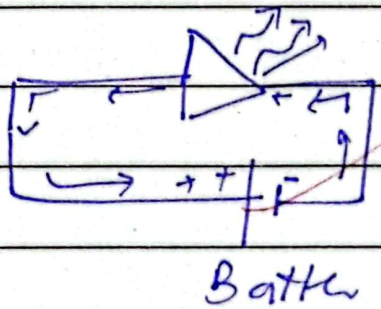
Explanation:

Diodes are composed of P-N junction. P-type cell has holes as its energy majority charge carrier whereas N-type cell has electron as majority charge carrier. When P-N cell is connected to a external voltage i-e battery in such a way that its positive terminal of battery is connected to p-type cells and negative terminal of the battery is connected to the N-type cell. so it could act as ~~ford~~ forward biased when voltage is passed through it and emit.

light.

How Light-emitting diode works:

Light emitting diode when connected to voltage making it to emit light when it is placed in forward biased condition. the movement of electron the energy change carrier from negative terminal to positive terminal of battery Electrons when more from battery, it allows potential difference created within the P-N junction to shrink thus depleting the depletion region. The fusion of electron with holes reduced the P-N depletion region and has reduced the potential difference. and some electron movement across the potential difference region and into the p-type cell cause the production and emission of light..



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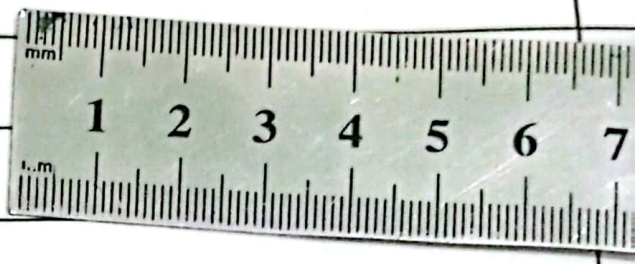
Application:

- LED lights are used in billboards
- used in traffic signals lights
- used in endoscopy, medical instrument

Part (D)

Ans:



Anticuidant:

Defination:

Antioxidants are the chemical, biological, organic or inorganic compounds that prevent the oxidation of food through stopping the formation of free radicals.

What do antioxidants do?

Antioxidants remove the oxidation of food and prevent

formation of free radicals i.e O atom to further decompose the oxidize the food.

Antioxidant remove the cause of oxidation by removing the water contents from food. or blocking the oxidation by reacting the available oxygen radicals.

Example of Antioxidants are

BHA = Butylated Hydroxy Anisole

Sodium Benzoates

Part (C)

Ans:

Food Adulteration:

Defination:

The change of food texture, colour, appearance, aroma, smell due to addition of food by enzymatic activity or chemical reaction led to food adulteration."

(•) Food adulteration can be in positive sense. It means the [not deliberate]

the addition of some extra things to improve the taste or make it more beneficial to health.

For example;
the addition of lemon to soup to make it sour and also to preserve it.

- Whereas food adulteration may be negative. It may be caused by addition or exposure to unbeneficial substances e.g.
  - Addition of baking soda in juice would make it unbeneficial or even make it impossible to drink.