Q.No.01

1. C
2. B
3. D
4. B
5. A

Q.No.02

(Ans a)

Earthquake:

Sudden shaking of Earth crust due to the seismic waves coming on the ground due to the volcanic activity underneath.

When in the earth's crust, volcanic activity and movement of tectonic plates causes the fissure on the earth's crust. Through these fissures seismic waves come on the ground surface resulting in earthquake.

Primary Causes of Earthquakes:

1. Movement of Tectonic Plates:

Earth's Lithosphere is not continu-ous throughout but have divisions

These divisions of lithospheric forms the tectonic plates. These plates are in continuous motion. Wether these plates rub against each other, one plate diverge on another and one converge on each other. Thus causing an earth quake.

Convergence of plates.
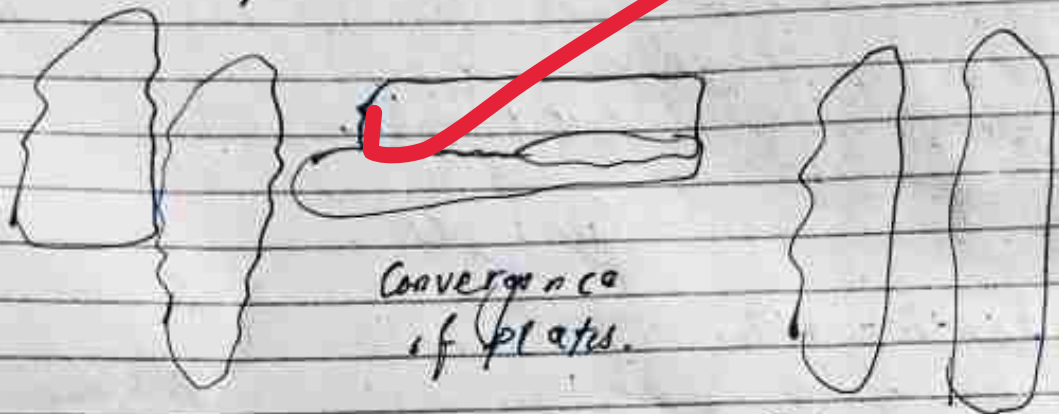
Rub against each other

Divergence of plates

2. Volcanic Eruptions:

Earthquake is also caused by the volcanic eruptions, isostatic movements and seismic waves. These are the mechanical causes of an earthquake. Regions located along the ring of fire are most vulnerable also to the earthquake.

3. Tsunamie → a passive cause

Tsunamie or harbour wave is a passive cause of earthquakes. It causes the sea water to come on the shore and followed by earthquake.

Recently an earthquake emergency is declared in Japan.

Different Types of Seismic Waves:

1. Surface Waves:

Waves produced by the seismic activity which remain and spread only on the surface called surface waves.

These waves covers the surface of the earth's crust and are low in intensity.

2. Body Waves:

Waves produced by the seismic activity which spread along all the directions called body waves.

These waves when produced covers the entire region and are relatively high intensity.

← →

Additives:

Substances which are added to the edibles for different purposes called additives.

These substances comes in many forms and are added to the things which are being consumed by the humans. Substances like preservatives and anti-oxidents are mostly used for giving flavours to the edibles.

Preservatives:

Substances which are added to the edibles to prevent or slow down the growth of bacteria or fungi.

The main purpose of the preservatives are to restrict the growth of micro-organisms so that the food can be kept safe for the longer period.

Anti-oxidents:

Compounds used by the body to prevent the formation of free-radicals.

Free radicals are destructive for the normal cells of the body so that their growth is restricted by the use of anti-oxidants.

Role of Additives in Food Preservation:

1. Additives Preserve the food for longer period:

   To preserve the food for the longer period different additives mainly preservatives are used. For example sugar, table salt have been used as preservatives for jelly, meat respectively.

2. Additives Prevent the Food from the Attack of Micro-organisms:

   foods are being spoiled by the attack of micro-organisms like bacteria and fungi. The preventions of food from the micro-organisms are being done by the use of preservatives.

3. Additives Give Flavour to the Food:

   Different flavours like sweat, crispy, salty and many more are added to the food for giving a specific flavours to the food.

4. Prevention of oxidation:

Oxidation causes the rancidity in the food. Potato chips, crackers are exposed to the rancidity by the exposure of the cats which is being prevented by the addition of anti-oxidants.

←——————→

(Ans c.)

Food Preservation:

Methods used to prevent the food from spoilage ers. lled food preservation.

Different methods like canning, freezing, drying, refrigeration and many more re used for the food preservation.

Principle Behind Dehydration as a method for Food Preservation:

Dehydration removes one or more substances from the food which causes the food to spoil.

It involves various methods like heating, drying, cooling and acidification.

1. Heating:

In this method of food preservation heating of food is done to kill the microorganisms at specific temperature. The bacteria present in the milk are destroyed by pasteurization at 83°C for ___ min.

2. Drying

Some of the microorganisms are grown best in the presence of water. So, the removal of water is necessary to stop the growth of microorganisms. To remove water drying is done.

3. Colding:

The growth of most bacteria are but at high temperature and are restricted at low temperature. For example at temperature below 10°C the growth is slow and at -40°C all the growth are completely seized.

4. Salting: Add examples

Salts are added to the edibles which soaks water and also kill the bacteria and fungi. For example meat of fish and other crispy products are added to salts so that these can be used for proper and long term use

(Ans 1)

Total Internal Reflection:

When incident light strikes a surface at a specific angle and then bounces back in the same region from where it is produced. This phenomena is called total internal reflection.

Light of incident rays strikes the surface and without further going on the next region bounces back and prevents losses of incident light.

incident ray

reflected ray
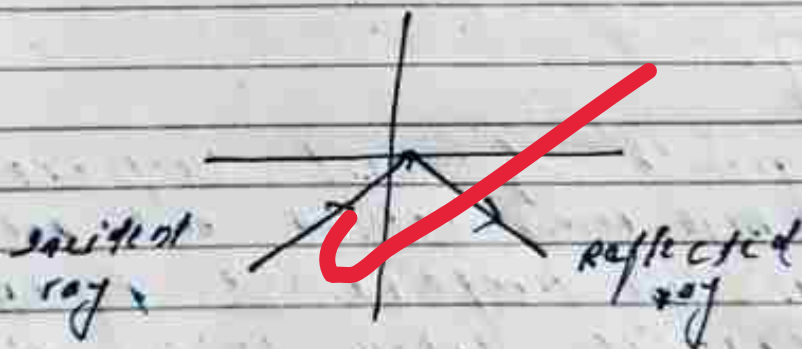
Total internal reflection

Optical Fibre:

A cable which is used in communication mainly made of glass and transmits signals in the form of light.

Significance of Total Internal Reflection in Optical Fibre Communication:

1. Serve as Basic Phenomenon to transfer signals:

Total internal reflection serve as the basis of transfer of signals smoothly from one place to another. Signals in the form of light is transmitted thus paving the way for communication.

2. Communication is Done Smoothly Without Distraction:

Communication in the form of light signals is carried out without the loss of any signals. Therefore, this phenomenon causes the light to travel smoothly in the core so that every signal carried out to destined place without disruption.

3. Communication can be Done to the Longer Distances:

Total internal reflection causes the light signals to travel to a long distances. In this way communication is carried out at long distances. This is evident in the cables which is laid down undersea to carry out communication.

(Ans.4)

Compound Interest:

Interest imposed on a loan or deposit amount called compound interest.

It is also called the interest on interests. It is calculated yearly, semi-annually and quarterly.

Examples:

Compound interest is mainly used in:

→ Saving accounts
→ Loans
→ Investments
→ Credit cards.

Simple Interest:

Interest collected on the initial principle amount called simple interest.

It is collected at any time and is commonly used for:

→ Short term loans
→ Saving accounts.

Examples?

(Ans b)

Data:

Ratio of first to second class fares : 6:4

Ratio of passengers from first to second class = 1:30

Total fare collected = 2100

To Find:

Fare of first class passengers = ?

Calculations:

Let,

First class fare = 6x

2nd class " = 4x

Total fare collected = 6x + 4x = 2100

$$6x + 4x = 2100$$
$$6x + (30)x = 2100$$
$$126x = 2100$$
$$\boxed{x = 16.6}$$

Sol:

First class fare = 6x = 6(16)

≈ $\boxed{100}$

Amount collected from first class = Rs 100

(Ans c)

Data:

Price of TV = 2100

Depreciation = 5%

Passed years = 3

To Find: ?

Value of TV after 3 years = ?

Calculations:

1st year depreciation = 5% of 21000

0.05 × 21000 = 1050

value after 1st year = 21000 - 1050 = 19950

2nd year depreciation = 5% of 19950

0.05 × 19950 = 997

value after 2 years = 19950 - 997 = 18952

3rd year depreciate = 5% of 18952
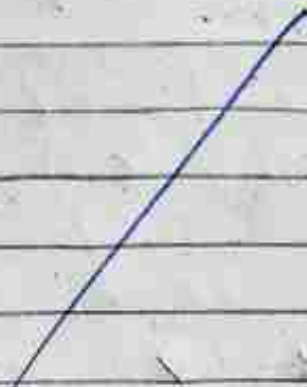
0.05 × 18952 = 947

value after 3 years = 18952 - 947

= 18004

So,
The value of TV after 3 years
is approx Rs. 18004

Q. No. 1	Select the correct answers of the following: (1 x 5 = 5 Marks) **1. Where do the Prime Meridian and the equator intersect each other point?** A. Arabian Peninsula B. Malacca Strait C. Gulf of Guinea D. All of These **2. Which of the following is a rich source of Vitamin B-12?** A. Cashew nut B. Milk C. Apple D. Watermelon **3. Which of the followings planet can float on water?** A. Saturn B. Mars C. Venus D. None **4. What is the main composition of the sun?** A. Oxygen and Ammonia B. Hydrogen and Helium C. Hydrogen and Oxygen D. Methane and Hydrogen **5. Which of the following will you use to remove rust stains on cloth?** A. Alcohol B. Oxalic Acid Solution C. Kerosene Oil D. None of These

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PART – II

Attempt any ONE of the following Questions from General Science. The question of General Ability is mandatory to attempt.

Q. No. 2	a) Explain the primary causes of earthquakes and the different types of seismic waves they produce. b) Discuss the role of additives such as preservatives and antioxidants in food preservation, citing examples of each. c) Explain the principles behind dehydration as a method of food preservation and provide examples of foods preserved using this technique. d) Explain the concept of total internal reflection and its significance in optical fiber communication.
Q. No. 3	a) Explain the difference between LAN, WAN, and MAN networks, providing examples of each. b) Describe the octet rule in chemical bonding. How does it apply to the formation of ionic bonds? Provide examples. c) Discuss the structure and significance of nucleic acids in the context of genetics and heredity. d) Elaborate on the role and structure of mitochondria within a cell. Discuss how mitochondria contribute to cellular respiration, ATP production.
Q. No. 4	a) What is compound interest and simple interest? Explain with examples. b) The ratio of the first and second-class fares between the two stations is 6: 4 and the number of passengers traveling by first and second-class is 1:30. If Rs. 2100 is collected as fare, what is the amount collected from first class passengers? c) A TV was bought for Rs. 21,000. The value of the TV was depreciated by 5% per annum. Find the value of the TV after 3 years. (Depreciation means the reduction of value due to use and age of the item) d) Evaluate using long division method: 1. $\sqrt{56}$ 2. $\sqrt{1444}$ 3. $\sqrt{4489}$ 4. $\sqrt{6241}$ 5. $\sqrt{7056}$