

The reliance on traditional non-renewable forms of energy this reduces environmental degradation caused by non-renewable forms of energy.

Explanation of solar energy:-

Solar energy is a form of Renewable energy that is obtained from ~~the~~ solar radiations. They are placed in specific locations where there is large amount of solar sun rays. It can produce ~~the~~ energy by two main mechanism. First one is through Photo voltaic cells (PVC) which are made up of semiconductor material like silicon. When sunlight hit on this semiconductor material it converts this into electric energy through excitation of electrons. Second way is through solar thermal capturing system they capture sun's heat to produce hot water or steam. This heat can be used for domestic hot water, space heating or even generating electricity on large scale. Note that it is a clean energy which does not produce harmful emission and can be used as a friendly alternative to electricity that is produced by oil or through coal. Recently, all around the world even in Pakistan electricity is being produce through these solar ~~plants~~ panels as it is affordable and cheap alternative to fossil fuel energy.

b) What are rocks? Give its types and describe rock cycle

What are rocks?

Rocks are naturally occurring solid mass or aggregates of minerals or minerals or organic matter. They are found in the earth's crust and vary in composition, form, texture and appearance.

Types of Rocks

There are 3 main types of rocks on the basis of how they are formed.

(i) Igneous Rocks - They are formed from the cooling and solidification of molten rock i.e. magma or lava. Examples of these rocks are

(a) Granite -> An intrusive igneous rock formed inside the earth from slowly cooled magma.

(b) Basalt -> An extrusive igneous rock formed from rapidly cooled lava on the earth's surface.

(c) Obsidian - It is a volcanic glass that is formed by the rapid cooling of lava.

(ii) Sedimentary Rocks - It is formed by the accumulation, compaction and cementation of sediments such as minerals, organic material or rock fragments. These are

- i) Sandstone, which is formed from compacted sand particles
- ii) limestone which is often formed from marine organisms like shells and corals or from the precipitation of minerals from the water.
- iii) shale: - It is formed from compacted clay or mud
- iv) Conglomerate which is made from rounded rock fragments cemented together.

(3) Metamorphic rocks: - They are formed when the existing rocks which can either be igneous, sedimentary or metamorphic ~~are~~ undergo high heat pressure or chemical process that alters their mineral composition or structure. These are

- i) Marble which is formed from the metamorphism of limestone
- ii) Slate: - which is formed from the metamorphism of shale
- iii) Schist: - A foliated metamorphic rock which is formed from shale or other rocks under high temperature or ~~heat~~ pressure.

iv) Gneiss: - It is formed from the metamorphism of granite or other rocks under extreme conditions.

3) Rock cycle: -

A cycle through which rocks are formed, altered, destroyed and reformed is known as Rock

cycle. This shows how the three main types of rocks are interconnected. This cycle is driven by heat, pressure, erosion and melting.

Below is the illustration of this cycle along with its explanation.

- a) Firstly, the formation of Igneous Rock takes place which is formed by cooling and solidification of molten rock material known as magma (beneath the earth's surface) or lava (on the earth's surface). Example of it is Granite which is formed when magma is cooled slowly beneath the earth's surface and Basalt which is formed when lava is cooled rapidly above the earth's surface.
- b) Second step is when igneous rocks and other rocks are broken at the surface of the earth by natural forces like wind, water and ice in a process known as weathering. These broken pieces which are called sediments are transported by river, wind, glaciers or oceanic currents and accumulate in large in different environments like lakes, river oceans etc.
- c) Now, the third step is the step of the formation of sedimentary rocks. This is done by compaction and cementation of these segments over time. In this process the pressure from the underlying layers causes the sediments to stick together and harden. For example

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Sandstone and limestone

(iv) fourth step is the formation of metamorphic rock. It is done when sedimentary or igneous rocks are subjected to intense heat and pressure within the earth altering their structure and mineral composition to form metamorphic rocks. For example shale becomes slate.

(v) last step is the step in which metamorphic rocks are melted to form magma. And this stage marks the restart of the cycle when it cools down to form igneous rock.

(c) Difference between saturated and unsaturated fats. Give its importance.

Saturated fats

> Chemical structure of saturated fat is that it contains no double bonds between carbon atoms in their fatty acid chains. All carbon atoms are saturated with hydrogen atoms.

> Typically are solid at room temperature e.g. butter

> Mainly obtained from animal products i.e. meats, butter, cheese and though some tropical oils

Unsaturated fats:-

> They contain one or more double bonds in their fatty acid chains leading to fewer hydrogen atoms.

> They are usually liquid at room temperature like oil.

> They can be mono-saturated or poly-saturated. The mono-saturated are good

and nuts. While the polyunsaturated ones are obtained from fish, walnuts, flax seeds and vegetable oils.

→ They are linked to LDL which is a bad cholesterol. Its increase can lead to

diseases like cardiac arrest.

→ Monounsaturated fats helps in decreasing the LDL levels and raises the HDL levels (Good cholesterol). Similarly, polyunsaturated also reduce the risk of heart disease.

→ Unsaturated fats when are artificially hydrogenated to become solid. For example

Importance of fats:-
essential

Fats are macronutrients which are required by our body because of the following importance.

(a) They provide 9 cal per gram energy, which is more than double the amount of energy provided by carbohydrates.

(b) They are important for the absorption of fat soluble vitamins like A, D, E & K.

(c) Important component of cell membrane, and their proper structure and function. Moreover, they help in cell signaling, affecting growth, immune function and communication between the cells.

(d) Formation of hormones like steroid hormones i.e. estrogen and testosterone.

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Q Brief of water soluble vitamins

There are two types of vitamins one are water soluble and the others are fat soluble. Water soluble vitamins are those that can be dissolve in water and are cannot be stored in our body for a significant amount of time and hence it is important to consume them daily in our diet.

Following are some of the characteristics of water soluble vitamins:

- (a) Dissolve in water.
- (b) Excess amount of them are excreted in urine reducing the risks of toxicity.
- (c) Requires daily in our diet.
- (d) They are vitamin B complex and vitamin C.
- (e) Vitamin B complex is a group of eight vitamins. These include vitamin B₁ (Thiamine) this converts food into energy and supports nerve functions.
- (f) Vitamin B₂, also known as Riboflavin, helps in the production of antioxidants.
- (g) Vitamin B₃, also known as Niacin, supports metabolism & skin health and it also helps in reducing cholesterol levels.
- (h) Vitamin B₅ is also known as Pantothenic acid, is essential for forming co-enzymes and fatty acids.
- (i) Vitamin B₆ (pyridoxine) helps in amino acid metabolism and neurotransmitter production.
- (j) B₇, also known as Biotin, promotes health.

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- (g) Vitamin B3, also known as Niacin, supports metabolism & skin health and it also helps in reducing cholesterol levels.
- (h) Vitamin B5 is also known as Pantothenic acid, is essential for forming co-enzymes and fatty acids.
- (i) Vitamin B6 (pyridoxine) helps in amino acid metabolism and neurotransmitter production.
- (j) B7, also known as Biotin, promotes health.

- skin hair and energy.
- (k) B₆ (folate) is vital for DNA synthesis and for the formation of RBCs.
 - (l) Vitamin C, also known as Ascorbic Acid, acts as an antioxidant. It supports immune functions, aids in collagen synthesis and enhances Iron absorption.
 - (m) They can be obtained from fruits like citrus fruits, berries, and green vegetables like leafy greens. Moreover, they can also be obtained from whole grains, dairy, egg, and meat.
 - (n) Its deficiency can lead to diseases like scurvy, beriberi and others.

Vitamin (unsaturated)

Vitamin B

- B₁ (Thiamine)
- B₂ (Riboflavin)
- B₃ (Niacin)
- B₅ (Pantothenic Acid)
- B₆ (Pyridoxine)
- B₇ (Biotin)
- B₉ (folate).

Vitamin C

Q NO: 3

(a) Write a short note on vaccine

Vaccine is designed to protect the body from certain diseases by making immune system resistant to it. It is typically made up of weakened, inactivated parts of disease.

causing organism. When it is entered into the body it stimulates our immune system to produce antibodies to fight it which results in creating immunity against the targeted organism. They play a very vital role in protecting our bodies against harmful virus, bacteria and diseases such as small pox, polio, ~~etc~~ and more recently, covid. Thus, it helps control the spread of diseases, reduces mortality and morbidity from infectious diseases. Therefore, vaccine plays a very vital role in overall global health. ~~of the~~

(B) What is Balance diet & explain its merits:-

Elucidating Balance diet:-

Balance Diet is a form of diet that provides appropriate macro and micro nutrients in an appropriate and required amount ~~grow body~~ along with fiber and water.

The components of Balance Diet are carbohydrates, proteins, fats, vitamins and minerals, fibers and water.

Merits of a Balance Diet:-

- (i) It supports growth and development and prevents us from conditions such as malnutrition, stunted growth etc.
- (ii) It is important for tissue repair in adults and growth and development in children.

- (iii) It enhances immunity and reduces susceptibility of diseases.
- (iv) Taking more nutrients in appropriate amount protect us from cardiac diseases which results due to heavy massive intake of unsaturated fatty acids.
- (v) It helps in maintaining healthy weight and thus preventing obesity or malnutrition.
- (vi) It also protects from diseases like osteoporosis, diabetes.
- (vii) Taking omega 3 fatty acids and vitamin like B helps in proper functioning of our brain.
- (viii) Proper functioning of our digestive system and urinary system by taking appropriate amount of fibers and water.

Q5) Write a short note on Carbohydrate

They are organic compounds made up of C, H and oxygen. They are primarily macro nutrient required by our body. They are classified into simple carbohydrates i.e. monosaccharides and complex carbohydrates i.e. Disaccharides and polysaccharides. They are an important source of energy in our body. They are obtained from foods like fruits, vegetables, grains and legumes. In our body they are converted into glucose which in turn used to produce energy. Moreover, it is important to mention that excessive amount of carbohydrates are store in the body in the form of glycogen.