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General Science
and
Ability

Question #03

Part (b) Balanced Diet

1. **Definition of Balanced Diet:**

   A balanced diet can be defined as a diet including adequate minerals, vitamins, proteins and other nutrients for healthy growth and proper functioning of body and prevention of diseases. A balanced diet is necessary for the well-being of individuals. A balanced diet ensures provision of required calories to the body.

2. **Constituents of a Balanced Diet:**

   A balanced diet contains portions from all major five groups of diet. These include;

   2.1: **Vegetables:** A balanced diet contains

leafy and green vegetables to provide required nutrients

2.2: Fruits: Different fruits should also be a part of a healthy, nutritious and balanced diet. Fruits can be of any category.

2.3: Dairy: The dairy products like milk, yogurt, cheese and a measured amount of butter are also important part of a balanced diet.

2.4: Proteins: Proteins should also form a part of a balanced diet. These can be from meat, eggs or any other source.

2.5: Grains: Various types of grains, beans lentils and pulses are required to form a portion of healthy diet.

3. Importance of a Balanced Diet:

A balanced diet is very important to maintain a healthy lifestyle.

3.1: Prevention of Disease: Without a healthy diet, human body becomes more susceptible to illnesses like diabetes, heart disease or cancer.

3.2: Ensures overall Well Being: Balanced diet ensures the overall well being of individual's physical as well as mental health.

3.3: Proper Functioning of Body: The body which intakes a balanced and healthy diet functions properly and in a better way.

3.4: Gaurantees Healthy Growth: The healthy growth of body is conditioned with provision of required nutrients via a healthy diet.

4. Achieving a Balanced Diet:

Along with addition of required food types, certain steps can ensure a full-fledged healthy, nutritious and balanced diet;

• **Hydration:** By keeping the body hydrated, body functions better. Scientifically, 3 litres of water intake for men and 2 litres of water intake for women daily is important.

• **Physical Exercise:** Keeping the body physically active makes it more stronger and immune to diseases.

• **Reducing Sugar and Salts:** A balanced diet only contains 10% of sugar intake for energy.

Q#03: Part c: Machine Learning

1. Definition:

Machine learning can be defined as the 'use of computers in such a way that they can function without explicit programming. Machine learning is the process in which the machines are allowed to function at their own to do certain activities.

2. Machine Learning is Revolutionising Contemporary World:

Machine learning is a subset of artificial intelligence. It has wide range of applications which are revolutionizing the contemporary world.

2.1: Spam Filteration:

Machine learning enables to filter spam emails and contacts very easily.

2.2: Content Recommendation:

Based on the input provided to it, machine learning software can recommend content to its users by keeping their choices in view.

2.3: Machine Learning Robots:

Collaborated efforts of robotics and machine learning provide highly useful robots that can perform repitetive tasks in industries.

2.4: Automated Cars:

Self-driving cars or automated cars are a product of machine learning. These cars can replace the jobs of drivers in near future.

3. Manual Jobs are endagered due to Machine Learning:

According to a report, 38% of manual and repetitive jobs are going to be replaced by 2030s in USA. These jobs will be replaced by machine learning softwares, robots and automated systems. It is a threat to financial sources of many people if not addressed properly and timely.

Question #03 : Part D: RAM vs. ROM

RAM and ROM are the parts of primary or internal memory of a computer. There distinguishing ~~factors~~ features are given below:

RAM	ROM
Stands for	
Random Access Memory	Read Only Memory
Definition	
The type of computer memory that can be easily accessed and altered.	The type of computer memory that cannot be altered.
Volatility	
RAM is volatile in nature	ROM is non-volatile in nature
Types	
Static RAM	PROM
Dynamic RAM	EPROM
	EE PROM
Price	
It is expensive.	It is comparatively cheaper than RAM

RAM	ROM
Nature	
RAM is non permanent memory.	ROM is permanent memory.
Speed	
Additional RAM enhances speed of processor.	It does not affect speed of processor.
Function	
It allows read and write function	It only allows read function.

Question #02

Part b: Big Bang and Big Crunch

Big Bang is the most popular and accepted theory about origin of universe. Big Bang theory suggests that about 13.7 billion years ago, all matter existed in a condensed form called singularity. An explosion in singularity resulted in formation of time, space, matter and universe.
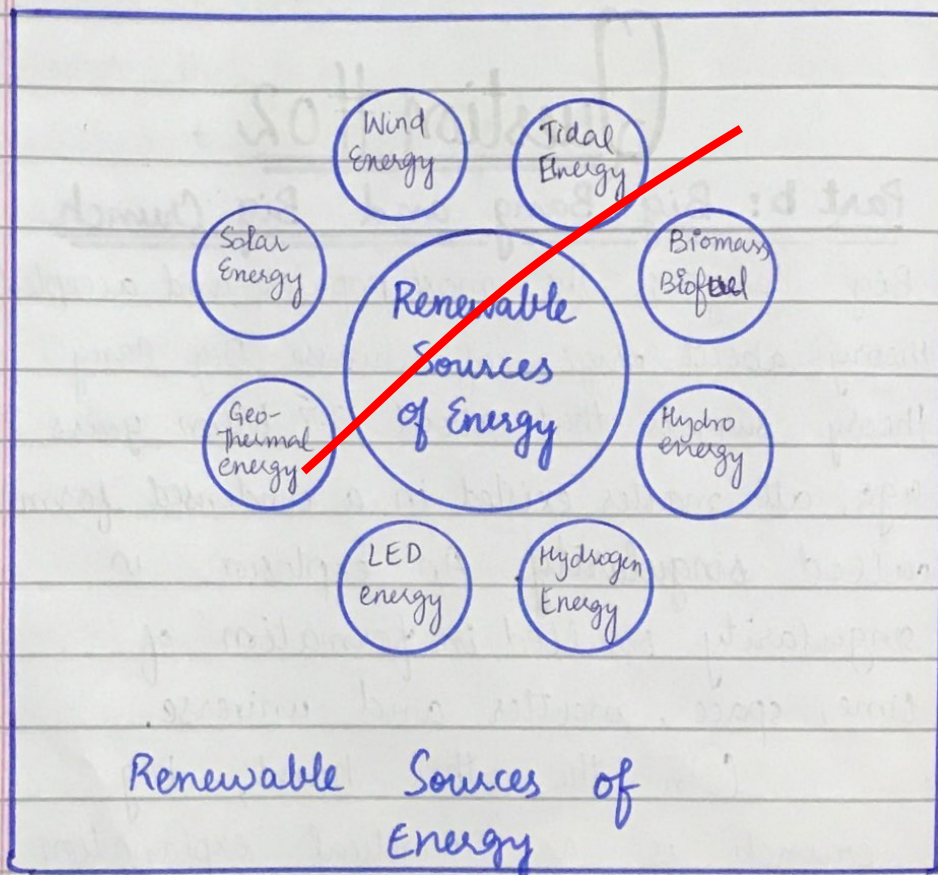
On the other hand, big crunch is a theoretical explanation of the ultimate end of universe. It

suggests that universe will eventually stop expanding and consequently, it will collapse. It is called big crunch.

Q#2 Part c: Renewable Energy Sources

Renewable energy sources are the ones that will not deplete and can be relinquished. Renewable energy sources are better options for sustainable and clean energy.

Wind Energy

Tidal Energy

Solar Energy

Biomass, Biofuel

Renewable Sources of Energy

Geo-Thermal energy

Hydro energy

LED energy

Hydrogen Energy

Renewable Sources of Energy

1. **Solar Energy:** Solar energy is the energy obtained from sun. The sunlight is converted into energy by using photovoltic cell, often called solar panels.

Benefits:

Sunlight is limitless. Solar energy is also a clean source of energy.

Limitations:

It is expensive to install at first. It also requires plently of sunlight and space for solar panel grids.

2. **Wind Energy:** Wind energy is the form of energy that is obtained from wind. The tides of wind provide energy to wind mills which produce electricity.

Benefits:

It is a clean source of energy as it does not produce any harmful by-products.

Limitations.

Wind mills threat the life of birds which die after striking with them. They also produce noise pollution

3. **GeoThermal Energy:** It is the steam that rises from the depths of earth and boils water in some streams. It heats water which produces energy.

Benefits:

It is clean and infinite source of energy.

Limitations:

Its underground infrastructure is vulnerable to earthquakes

4. **Hydro Energy:** Water is used to produce hydro energy. Water stored in dams are used to run turbines to produce electricity.

Benefits:

It is a clean source of energy. It produces more energy than wind energy because ↑ Water is denser than air

Limitations:

It affects the marine life adversely.

5. **Biofuel:** It is the fuel produced by organic matter's decay. It is usually a byproduct of industrial products like ethanol from sugar production.

Benefits:

It does not degrade environment. It is comparatively cheap. It is a cheaper but infinite source of energy.

Limitations:

At some points, its combustion leads to emission of green house gases which cause global warming.

QH02 : Part d : Working of Optical Fibre

1. **Defining Optical Fibre:**

Optical fibre can be defined as thin, transparent, thread like strand of glass or plastic that transmits information in form of light pulses.
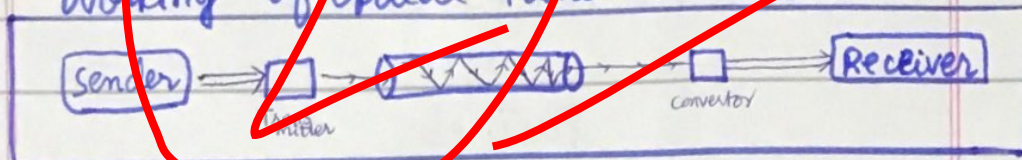
2. **Principle of Operation : Total Internal Reflection:**
Optical fibre works on the principle of total internal reflection. When incident angle becomes a certain angle that makes angle of refraction equal to 90, the light starts to reflect internally.
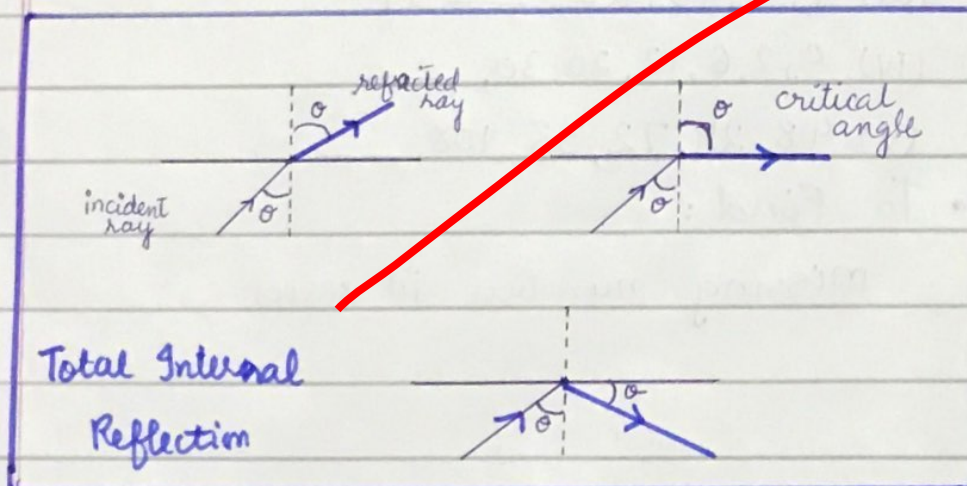
3. **Working of Optical Fibre Communication:**
In telecommunication, optical fibre is used to transmit data from one point to another. From sender's end, the ~~light~~ electric wave are converted into light waves by means of a transmitter. These light waves are transmitted through optical fibre.

Working of Optical Fibre Communication

On receiving point, a converter changes light signals into electric ones and information is passed to receiver.

Total Internal Reflection

Question # 08

Part (a)

- **Data Given:**

  Sum of three consecutive odd numbers = 273

- **To Find:**

  Three consecutive odd numbers = ?

- **Solution:**

  Sum of 89, 91, 93 is 273

  All these three digits are odd as

  well as occur consecutively.

  $$\boxed{89 + 91 + 93 = 273}$$

Part (b)

- **Data Given:**

  (i) 4, 16, 36, 64, ___, 144

  (ii) 30, 29, 27, ___, 20, 15

  (iii) 1, 7, 15, 25, ___ 51

  (iv) 0, 2, 6, 12, 20, 30, ___

  (v) 48, 24, 72, 35, 108, ___

- **To Find:**

  missing numbers in series

(i) 4, 16, 36, 64, __100__, 144

Square ~~root~~ of even numbers = $2^2, 4^2, 6^2, 8^2, 10^2, 12^2$

(ii) 30, 29, 27, __24__, 20, 15

$\boxed{30} - 1 = \boxed{29}$

$29 - 2 = \boxed{27}$

$27 - 3 = \boxed{24}$

$24 - 4 = \boxed{20}$

$20 - 5 = \boxed{15}$

Subtracting 1 to 5 from each number in series.

Part (c)

- **Data Given:**

  (i) THRSI   (ii) GNDREA

  (iii) SCHAMOT   (iv) ONLNDO

  (v) HIODALY

- **To Find:**

  Correct words from given jumbled spellings.

- **Solution:**

  (i) THRSI   **SHIRT**

  (ii) GNDREA   **GRANDE**

  (iii) SCHAMOT   **CAMSHOT**

  (iv) ONLNDO   **LONDON**

  (v) HIODALY   **HOLIDAY**

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schamot
schamot
Gender
Grande
Match
SHOT
CAMSHOT