

Q a) Differentiate between a star and a planet. What is the magnitude of a star and how the color of stars is correlated with their temperatures?

Difference between Star and Planet

Ans

Defining a Star.

A star is a celestial body having light that causes it to reflect the light independently.

Defining a Planet

A planet is a celestial body having no light.

Composition:

A Star: It is made up of Hydrogen and Helium

A Planet: It is made up of all forms of matter.

Example:

A Star: Sun, Proxima Centauri

A Planet: Earth, Jupiter

Magnitude of a Star.

The magnitude of a star is the measure of the brightness of a star.

The lower the magnitude assigned, the brighter the star will be.

Correlation of color of a star with the temperature.

The color of a star provides a direct measurement of its surface temperature. The relation may be as:

	Color	Degree of temperature
(i)	Blue white	Cooler ; low temperature
(ii)	Dull orange or red	Hottest ; High temperature.

b- "Semi-Conductors are the Brains of Modern Electronics"
Explain in detail what this question means.

Semi-Conductors

"A material used in electrical circuits and components which partially conducts electricity."
- Investopedia -

Example: Silicon and Germanium.

Semi-Conductors: Brains of Modern Electronics.

Semi-Conductors are considered as Brains of modern Electronics due to following facts:

" Structural part of } ⇒ These are
major electronics } present in
Computers.

Cell-phones, Satellites,
and other devices.

2// Controlling power } ⇒ Semi-Conductors
manage flow of
electric current.

3// Storage of data } ⇒ The integrated
Circuits of memory
units are made
up of Semi-Conductors.

4// Existence of Electronics } ⇒ without Semi-
Conductors, there
would be no
electronic devices.

5// Forms building blocks of electronics } ⇒ Transistors, diodes
and microprocessors
are made up of
Semi-Conductors.

Q/ Briefly describe the most popular and accepted theory about the origin of the Universe.

Origin of the Universe

The most popular and accepted theory about the origin of the universe is The Big Bang Theory.

Big Bang Theory



Considers Universe was a single point



Universe was infinitely hot and dense.



Around 13.7 billion years ago, an explosive began

The Universe started to flatten outwards



It marked the creation of stars, planets, galaxies, atoms, matter, particles and so on.



The Universe started expanding.



Scientists argue that Universe will still continue to expand

Thus, the Big Bang Theory is the most acceptable concept about the origin of the Universe.

Q.4

What are the advantages and limitations of renewable energy resources? Briefly explain the prospects of non-conventional energy resources in Pakistan.

Renewable Energy Resources.

"Renewable Energy is energy derived from natural sources that are replenished at a higher rate than they are consumed." — The United Nations.

Advantages of Renewable Energy Resources

↳ Sustainability: Renewable resources will not run out.

Sun shines every morning it

could provide sole energy for years.

2) Reliability. These resources are reliable even during international conflicts.

3) Environment friendly: These resources cause less carbon emissions than non-renewable energy resources.

Limitations of Renewable Energy Resources.

Limited Availability.

These resources are not available round the clock

High Initial Cost.



Installing tidal energy could cost \$130-180 per megawatt hour (MWh)

Require a lot of space.



One turbine can require up to 80 acres of land.

Prospects of Non-Conventional Energy in Pakistan

The non-conventional energy is thriving at best rates in Pakistan. Following facts show the increasing role of non-conventional energy in Pakistan.

↳ Alternative and Renewable Energy Policy 2019.

↓ ↓
Pakistan intends to have 20% of its generation capacity as Alternative Renewable Energy (ARE) technologies by 2025 and 30% by 2030.

2. Constitutes major portion of Energy Projects in China Pakistan Economic Corridor

(CPEC)

↓ ↓
Around 30% of energy projects under CPEC are based upon Renewable Energy Resources.

3/ Increasing total installed capacity.

Wind Power Projects has the total installed capacity of 1985 Megawatt in July 2022. It was ~~19.5~~ 105.9 Megawatt in 2013. - Alternative Energy Development Board. (AEDB)

Thus, the prospects of non-conventional energy are bright in Pakistan.