

Q i) Briefly explain the most accepted theory of the universe.

Answer

The most accepted theory of the universe -  
Big Bang Theory

The Big Bang theory is also called the "Expanding Universe Theory." It was originated 13.8 billion years ago. The Big Bang theory is categorised into three stages:

i) Singularity

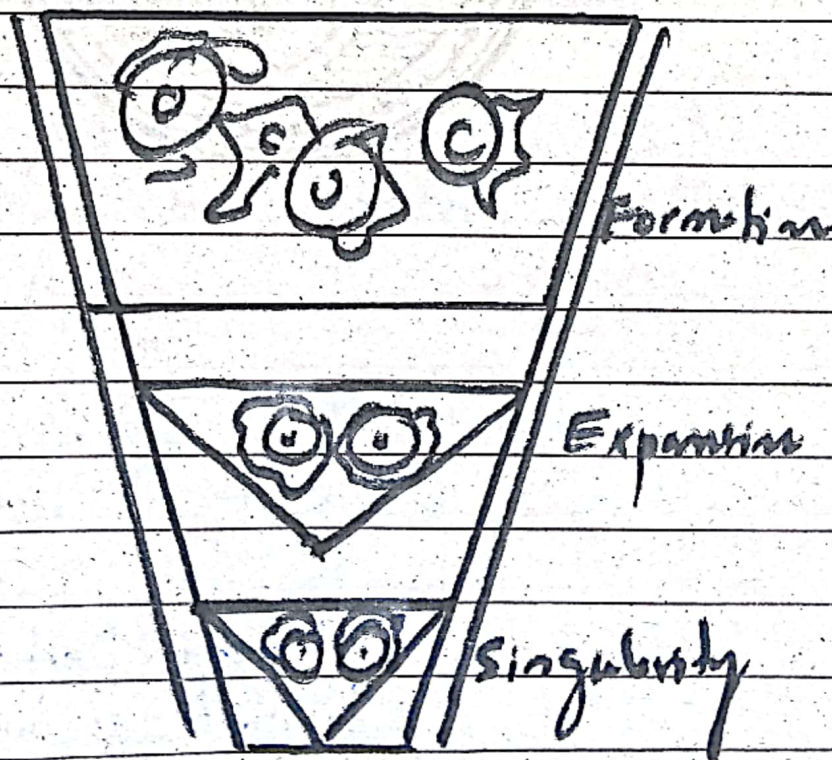
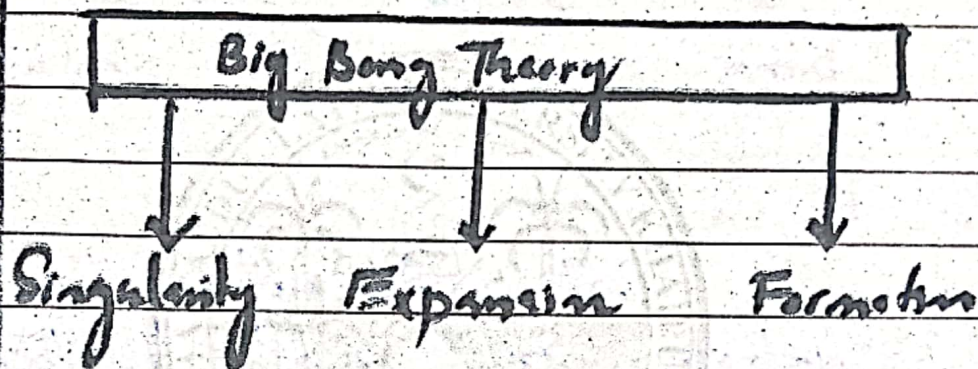
A dense and hot bubble is as a singular model.

ii)

Expansion: The force exist on that bubble and it expands. When it becomes cool, the substance is formed, called 'Quartz'.

iii) Formation:

All materials like 'quartz' combine together and every substance such as star, planet, moons etc are formed.



The Big Bang Theory

b) Difference between dark energy and dark matter

Answer:- Dark Energy:

Dark energy replaces universe galaxies and expands. Thus, support the big bang theory of the universe.

2. Dark Matter

Dark matter attracts the galaxies and binds together with the universe.

3. Basic comparison between Dark energy and dark matter

Comparison	Dark energy	Dark matter
Constituent	Dark energy is the first largest constituent of the universe.	Dark matter is the second largest constituent of the universe.

**Composition**

Dark energy is of 68% as a part.

Dark matter is 28% of the universe -

**Formation**

Dark energy is not particulates

Dark matter is made up of particles.

**Force**

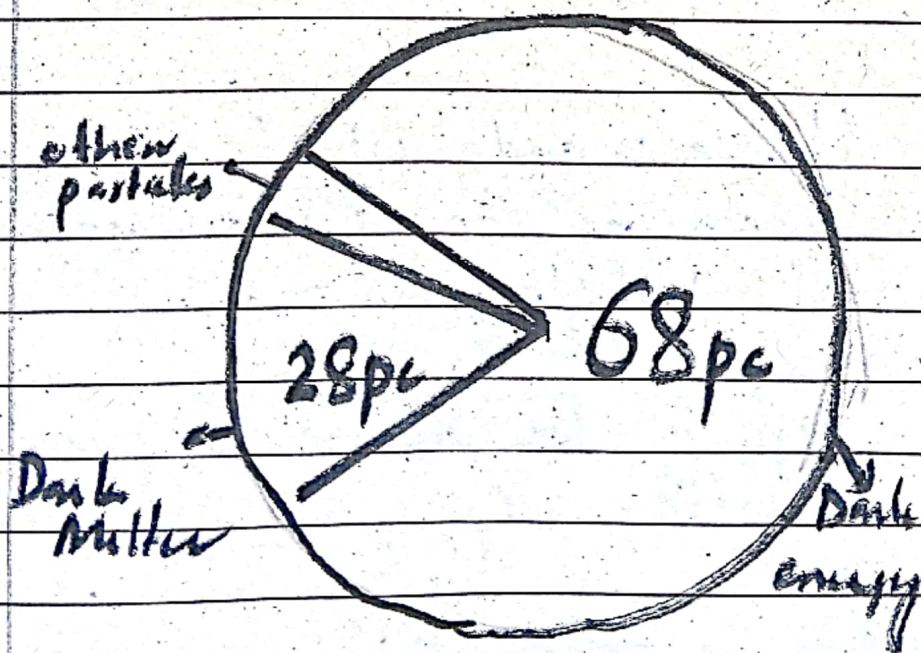
Dark energy exist  
"Repulsion Force."

Dark matter exist  
"Attraction force."

**Relation to universe**

It tears the universe.

It binds the universe.



• Composition of universe

c)

Describe the age of the universe

According to the 'Big Bang' theory, the universe has started 13.8 billion years ago. Moreover, in 1929, Edward Hubble has described the age of universe as follows:

- "Universe is flat, and it is made up of matter and possesses very low density."

(- Edward Hubble)

Universe is made up of matter. According to the equation of Hubble,

age of the universe as per matter is,

$$\frac{2}{3H}$$

Further, the universe possess very low density as described below:

$$\frac{1}{H}$$

hence, age of the universe is mathematically described as

$$\text{matter density} = \frac{1}{H^2}$$

d) Describe types of galaxies

Galaxy:

Galaxy is the foundation of the universe and universe is composed of hundreds of thousands of galaxies.

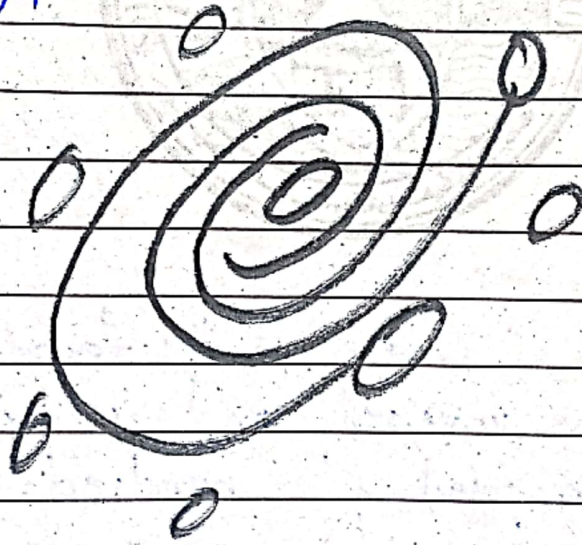
"The universe expands, but size of galaxies remains the same."

(- Edward Hubble)

Types of galaxies  
Following are types  
of galaxies:

i) Elliptical galaxy

The most abundant galaxy in the universe. It is oval in shape, but does not have particular appearance.



Elliptical galaxy

ii) Spiral galaxy

It is spiral in shape and it is made up of gas, dust, and stars. Spiral galaxy

expands outwards.

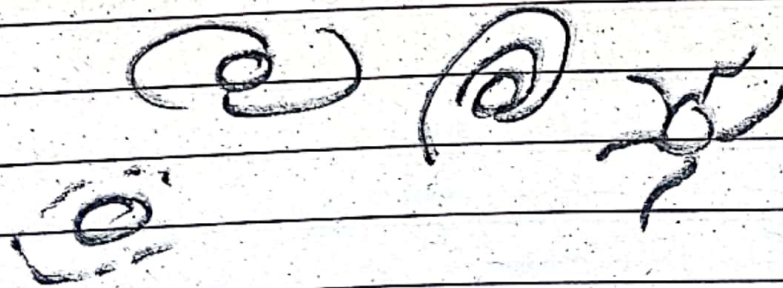


Spiral galaxy

iii)

Irregular galaxy

It is made up of dust and gaseous particles. Irregular galaxy has no particular shape.



Irregular galaxy



iv

### Milkyway galaxy

The most popular galaxy and is composed of twenty billion stars.

The nearest galaxy to milkyway galaxy is Andromeda galaxy.



### Milky way galaxy