

Batch 79

Part 2
Section 1

(Q3)

(a) Big Bang Theory:

A Big Bang Theory says that the universe began about 13 billion years ago (approx) from hot, tiny points. It then expanded rapidly and continues to expand today. In the universe there is 27% of Dark matter and 68% of Dark energy. Dark matter is an invisible matter that holds galaxies together, while Dark Energy is a force that is causing the expansion of the universe. There are certain ~~ex~~ evidence that supports Big Bang Theory (that are: i) Red shifts of Galaxies. ii) Abundance of Elements. iii) Cosmic Radiation (CMB).

b) Galaxies:

A Galaxy a massive system of stars, dust, gas and dark matter bounded by Gravity.

APM

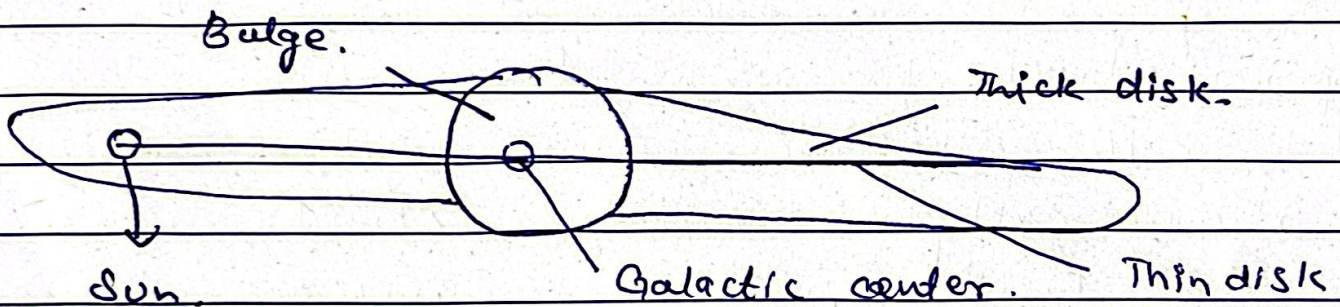
Classification:

Galaxies are classified into:

- i) Spiral Galaxies (flat with arms)
- ii) Irregular Galaxies (no definite shape)
- iii) Elliptical Galaxies (oval or round in shape)

Structure of Milky Way:

Our galaxy Milky Way is a spiral galaxy with Galactic center, bulge, Halo and a Disk with spiral arms.



c) Remote Sensing:

Remote Sensing is collecting data about Earth's surface with a physical contact. eg. through drones, satellites etc.

Types of Remote Sensing:

- i) Aerial photography.
- ii) Satellite Imaging
- iii) Radar and LiDAR.

Date:

These ~~above~~ above mentioned types are used in Tracking floods, earthquakes, monitoring crops, soil, water etc.

D) Human Brain

Human Brain controls thought, memory, emotions, movements and body functions.

Main Function:

- i) cerebrum is used for thinking, learning and memory -
- ii) Cerebellum is used to maintain balance & movement.
- iii) Brain Stem is used for breathing, heart ~~be~~ Beat and ~~s~~ survival functions.
- iv) ~~is~~ Limbic System is used for emotion & motivation.

Sleep, stress, anxiety, depression and Nutritions are some of the factors Affecting Brain functions.

Date:

4

Q4 (a) Fiber Optics:

Fiber Optics ~~use~~ use thin glass/plastic fibers to transmit light signals.

~~Through~~ Through Fibers data travels as light pulses.

It has many advantages over Copper.

For instance it has faster and higher bandwidth and can travel longer distance without loss. Plus it is more secure and durable.

And Light travels close to the speed of light inside fibers, enabling internet, phone, and TV with huge data capacity.

b) Earthquakes:

Earthquake is a sudden ^{release} ~~releas~~ of energy due to tectonic plate movements.

~~waves~~ Types of Seismic Waves:

- 1) Primary (P-waves) → Fastest.
- 2) Secondary (S-waves) → Slower.
- 3) Surface waves → most destructive.

APM

Earth quakes are measured through Richter Scale and Seismographs.

c) Balanced diet:

A Balanced Diet is a diet that provides all nutrients in proper amounts to body.

Macronutrients:

These are carbohydrates, Proteins and ~~fat~~ fats. They prevent malnutrition, Obesity, diabetes, heart disease and ~~Boosts~~ boosts immunity and energy.

Micro nutrients:

These are minerals and vitamins ~~that~~ that helps in regulating body processes.

d) Water pollution:

Sources:

- 1) Industrial waste
- 2) Sewage & domestic waste.
- 3) Oil spills, plastics

Date:

6

Effects:

Water pollution has serious and ~~hazar~~ hazardous effects on health and environment. It can cause typhoid, cancers and side by side death of aquatic life and ecosystem imbalance.

Prevention & Control:

Some of them are:

- 1) Reduce plastic & Chemical use.
- 2) Proper sewage treatment.
- 3) Reforestation to reduce runoff.
- 4) Commonly awareness.
- 5) Strict laws.

Section II

Q5.

(b)

'positive number x ' such that $x + 17 = \frac{60}{x}$.

$$x + 17 = \frac{60}{x} \rightarrow \textcircled{1}$$

Multiplying b/s by ' x '

APM

(7)

$$\Rightarrow x(x+17) = \frac{60}{x} \times x$$

$$\Rightarrow x^2 + 17x = 60$$

$$\Rightarrow x^2 + 17x - 60 = 0$$

Now we need two numbers whose product is -60 and sum is 17 so these are '20' and '-3':

$$(x+20)(x-3) = 0 \quad (\text{factorizing the quadratic equation})$$

$$\text{so } x+20=0, x-3=0$$

$$x = -20, x = 3$$

$$\boxed{x=3} \text{ Answer.}$$

Q6

(a) If $xy = 20$ and $x^2 + y^2 = 289$
we have to find $x+y$.

using identity $(x+y)^2 = x^2 + y^2 + 2xy$. $\rightarrow$ ①

Substituting values in ① we get

$$\begin{aligned} (x+y)^2 &= 289 + 2(20) \\ &= 289 + 40 \\ &= 329 \end{aligned}$$

So.

$$x+y = \pm \sqrt{529}.$$

$$= \pm 23.$$

We will take positive value.

So the answer is 23.

b) Let 't' be the scaling factor 8n years ago,

$$k-6 = 6t, \quad s-6 = 5t.$$

So present ages are $k = 6t + 6$, $s = 5t + 6$.

Four years hence:

$$\frac{k+4}{s+4} = \frac{11}{10}$$

By substituting values, we get.

$$\Rightarrow \frac{6t+6+4}{5t+6+4} = \frac{6t+10}{5t+10} = \frac{11}{10}.$$

Cross multiplying.

$$10(6t+10) = 11(5t+10) \Rightarrow 60t+100 = 55t+110.$$

$$\Rightarrow 60t - 55t = 110 - 100. \Rightarrow 5t = 10$$

$$\frac{5t}{5} = \frac{10}{5} \Rightarrow t = 2.$$

So, Salman's present age will be:

$$s = 5t + 6 \Rightarrow s = 5(2) + 6 \Rightarrow s = 10 + 6 = 16.$$

s = 16 Answer. (Salman is 16 years old.)