QB365 Question Bank Software Study Materials

Universe Important 2,3 & 5 Marks Questions With Answers (Book Back and Creative)

9th Standard

Science

Total Marks : 75

2 Marks

10 x 2 = 20

1) What is solar system?

Answer : The Sun and celestial bodies which revolve around it form the solar system.

2) Define orbital velocity.

Answer : The horizontal velocity that has to be imparted to a satellite at the determined height, so that it makes a circular orbit around the planet is called orbital velocity.

3) Define time period of a satellite.

Answer : Time taken by a satellite to complete one revolution round the earth is called time period.

Time period T = $\frac{Distancescovered}{Orbitalvelocity}$

4) What is a satellite? What are the two types of satellites?

Answer : A body moving in an orbit around a planet is called Satellite.

They are two types.

i) Man made or Artificial Satellites

ii) Natural Satellites.

5) What is a cosmic year?

Answer : It is the time duration required for the Sun to orbit once around the centre of the Milky way galaxy. It takes 250 million years to do that.

6) What do stars produce?

Answer : The stars produce heat, light, ultraviolet rays, X-rays, and other forms of radiation.

7) Define - Constellation.

Answer : A group of stars forms an imaginary outline or meaningful pattern on the space. They represent an animal, mythological person or creature, a god, or an object. This group of stars is called constellation.

8) What is infrared rays?

Answer : Most of the energy emitted by the Sun is visible light and a form of radiation known as infrared rays.

9) Classify the following as inner and outer planets Jupiter, Saturn, Mercury, Mars, Neptune, Earth, Uranus, Mercury.

Answer : Inner Planets → Mercury Venus, Earth, Mars.

Outer Planets → Jupiter, Uranus, Neptune, Saturn.

10) Why are the outer planets called as gaseous planets?

Answer : The planets are made of hydrogen, helium and other gases in huge amounts and have very dense atmosphere. So they are called gaseous planets.

3 Marks

10 x 3 = 30

11) Write a note on the inner planets

Answer : 1. The first four planets Mercury, Venus, Earth and Mars are relatively close together and close to the Sun. They form inner solar system and so they are called as inner planets .

2. They have a surface of solid rock crust and so are called terrestrial or rocky planets .

3. Their insides, surfaces and atmospheres are formed in a similar way and form similar pattern.

12) Write about comets.

Answer : 1. Comets are lumps of dust and ice that revolve around the Sun in highly elliptical orbits. Their period of revolution is very long .

2. When approaching the Sun, a comet vaporizes and forms a head and tail .

3. Some of the biggest comets had tails of length 160 million km long .

4. Many comets are known to appear periodically.

5. Ex. Halley's comet, which appears nearly every 76 years.

13) State Kepler’s laws.

Answer : Kepler's three laws of planetary motion.

First Law: The Law of Ellipses

The path of the planets about the Sun is elliptical in shape, with the center of the Sun being located at one of the foci.

Second Law: The Law of Equal areas.

An imaginary line drawn from the center of the Sun to the center of the planet will sweep out equal areas in equal intervals of time.

Third Law: The Law of Harmonies

The ratio of the squares of the periods of any two planets is equal to the ratio of the cubes of their semi major axis from the Sun.

14) What factors have made life on Earth possible?

Answer : 1. The earth is the only planet in the solar system which supports life .

2. Due to its right distance from the sun, it has the right temperature, the presence of water and suitable atmosphere and a blanket of ozone.

3. All these factors have made continuation of life possible on the Earth.

15) What is dark matter and dark energy?

Answer : 1. Dark matter gets its name because it cannot be seen with any type of instrument that we have today around 27% of universe is made up of dark matter.

2. Dark energy is something that fills all space around 68% of the universe is dark energy.

3. The theory of dark energy helps us to explain why the universe is expanding.

16) What are meteors and meteorites?

Answer : 1. Meteors are small pieces of rocks scattered throughout the solar system .

2. They travel with high speed, they come close to the earth's atmosphere and are attracted by the gravitational force of the earth .

3. Most of them are burnt up by the heat generated due to friction in the earth's atmosphere. They are called Meteors .

4. Some of the bigger meteors may not be burnt completely and they fall on the surface of the earth, these are called meteorites.

17) What are asteroids? Name the biggest asteroid in the solar system.

Answer : Millions of pieces of rocks that were left over, when the planets were formed and now revolve around the sun are called as asteroids. The biggest asteroid is Ceres - 946 km across.

18) At an orbital height of 600 km. Find the orbital period of the satellite.

Answer : h = 600 x 10^3 m

V = 7616 x 10^3 krn/s

R = 6371 x 10^3 m

Substituting the values.

T = $\frac{2\pi(R+h)}{V}$

= $\frac{2\times\frac{22}{7}(6371+600)10^3}{7616}$

= 5.748 x 10^3

= 5748 seconds.

This is T ≈ 96 min

19) What are the scientific researches done in ISS?

Answer : The ISS are doing many scientific researches especially in biology, human biology, physics, astronomy and meteorology.

20) Expand the following.

i) ISS

ii) NASA

iii) WRS

iv) OGS

v) ISRO

Answer : i) ISS - International Space Station

ii) NASA - National Aeronautics and Space Administration

iii) WRS - Water Recovery System.

iv) OGS - Oxygen Generation System

v) ISRO - Indian Space Research Organisation

5 Marks 5 x 5 = 25

21) Give an account of all the planets in the solar system.

Answer : The first four planets Mercury, Venus, Earth and Mars form inner solar system called as inner planets. Other, four large planets Jupiter, Saturn, Uranus and Neptune spread out in solar system called as outer planets.

Mercury:

1. It is the first rocky planet nearest to the Sun. It is very hot during day time and very cold during night time.
2. One day is equal to 58.65 earth days and one year is 87.99 days.
3. It moves around the sun faster than any other planet.
4. It always appears in the eastern horizon or western horizon of the sky.

Venus:

1. It is the second brightest and hottest planet almost the same size as that of the earth.
2. A day of venus is longer than its year. Day is 243 earth days and year is 224.7 earth days
3. It spins in the opposite direction to all the other planets and so sun rises in the west and sets in the east here.
4. It appears in the horizon of eastern or western sky.

The Earth:

1. It is the third planet in the solar system which supports life.
2. Due to its right distance from the Sun, it has the right temperature, the presence of water and suitable atmosphere and a blanket of ozone.
3. It moves around the sun in 365.25 days and its rotation period is 24 hours.
4. It is slightly tilted on its own axis, due to that, seasons are possible on earth .
5. Earth appears bluish green due to the reflection of light from water and land mass on its surface

Mars:

1. It appears slightly reddish and so it is called as Red planet. It is the fourth planet in solar system.
2. It has two small moons called Deimos and Phobos.
3. One day on this planet is of 24 hours 37 minutes and one year is 687 earth days.

Jupiter:

1. It is the fifth planet and called as Giant planet
2. It is the largest and fastest planet having 3 rings and 65 moons.
3. Its moon Ganymede is the largest moon of our solar system.
4. One day is 9 hrs 55 min. One year in Jupiter equals earth's 11.86 years.

Saturn:

1. It is the sixth and yellowish planet having bright shiny rings.
2. It is the second biggest and giant gas planet in the outer solar system.
3. It rotates very fast, being 10.7 hours and revolution period 29.46 Earth years.
4. It has 60 moons, the largest one is Titan.
5. It is the only moon in the solar system which has clouds.

Uranus:

1. It is a cold gas giant and seventh planet of the solar system.
2. It has greatly tilted axis of rotation.
3. Its revolution period is 84 earth years and the rotation period is 17.2 hours.
4. Due to its peculiar tilt, It has the longest summers and winters each lasting 42 years.

Neptune:

1. It appears as greenish star. It is the eighth planet from the Sun and is the windiest planet.
2. Every 248 years, Pluto crosses its orbit.
3. It has 13 moons - Triton being the largest and it is the only moon moves in the opposite direction to the direction in which its planet spins.

22) Discuss the benefits of ISS.

Answer : **Supporting Water - Purification Efforts:**

1. Using the technology developed for the ISS, areas having water scarcity can gain access to advanced water filtration and purification systems.

2. This could very well be a life - saving difference for the people in such hazardous locations.

3. The water recovery system (WRS) and the oxygen generation system (OGS) developed for the ISS have saved a village in Iraq from being deserted due to lack of clean water.

Eye tracking technology:

1. The Eye tracking device, built for a microgravity experiment has proved ideal to be used in many laser surgeries.

2. This device tracks the eyes position very accurately without interfering with the surgeon's work.

3.Eye tracking technology is helping disabled people with limited movement and speech.

Robotic arms and Surgeries:

1. Robotic arms developed for research in ISS are providing significant help to the surgeons in removing inoperable tumours and taking biopsies with great accuracies.

2. Robotic arms do heavy lifting in Cancer treatment in the form of surgical robots.

3. ISS technology are useful in the development of improved vaccines, breast cancer detection and treatment, ultrasound machines for remote regions etc.

23) Write a note on orbital velocity.

Answer : 1. Artificial satellites are made to revolve in an orbit at a height of few hundred kilometers. At this altitude, the friction due to air is negligible.

2. The satellite is carried by a rocket to the desired height and released horizontally with a high velocity, so that it remains moving in a nearly circular orbit.

3. The horizontal velocity that has to be imparted to a satellite at the determined height so that it makes a circular orbit around the planet is called orbital velocity.

4. The orbital velocity of the satellite depends on its altitude above Earth.

5. Nearer the object to the earth, the faster is the required orbital velocity.

6. The orbital speed and distance permit the satellite to make one revolution in 24 hours. Since earth also rotates once in 24 hours, a satellite stays in a fixed position relative to a point on earth's surface. Because the satellite stays over the same spot all the time, this kind of orbit is called 'geostationary'.

Orbital velocity can be calculated using the following formula.

$V = \sqrt{\frac{GM}{R+h}}$

Where

G - gravitational constant (6.673×10^{-11} Nm^2 kg^{-2})

M - Mass of the earth (5.972×10^{24}kg)

R - Radius of the earth (6371 km)

h - height of the satellite from the surface of the earth.

24) Give an account of Stars .

Answer : 1. Stars were the fundamental building blocks of galaxies .

2. Stars were formed, when the galaxies were formed during 'big bang' .

3. Stars produce heat light ultraviolet rays, X-rays and other forms of radiations .

4. They are largely composed of gas and plasma .

5. They are built by hydrogen gases. Hydrogen atoms fuse together to form helium atoms and in the process they produce large amount of heat.

6. Our universe contains more than 100 billion galaxies and each of those galaxies may have 100 billion stars.

7. The brightness of the stars depends on their intensity and distance from the earth.

8. Stars appear to be in different colours depending on their temperature.

9. Group of stars are called as constellations .

10. There are 88 formally accepted constellations such as Aries, Gemini, Leo etc.,

25) Describe the formation of the sun.

Answer : **Formation of the Sun:**

(i) At the time of the Big Bang, hydrogen gas condensed to form huge clouds, which later concentrated and formed the numerous galaxies. Some of the hydrogen gas was left free and started floating around in our galaxy.

(ii) With time, due to some changes, this freefloating hydrogen gas concentrated and paved way for the formation of the Sun and solar system.

(iii) Gradually, the Sun and the solar system turned into a slowly spinning molecular cloud, composed of hydrogen and helium molecules, along with dust.

(iv) The cloud started to undergo the process of compression, as a result of its own gravity. Its excessive and high-speed spinning ultimately resulted in its flattening into a giant disc.