

## 20. In the world of stars

1. Write the proper words in the blanks.

(Meridian, horizon, twelve, nine, apparent, celestial, ecliptic )

(i) When seen from a great distance, the sky seems to be touching the ground along a circle. This circle is called the..... .

(ii) The..... is used while defining the zodiac signs.

(iii) Classified according to seasons, one season will have ..... nakshatras.

(iv) The rising of the sun in the east and its setting in the west is the..... motion of the sun.

(v) Pole star has ..... constellation on one side and ..... constellation on the other side.

Ans : (i) horizon (ii) ecliptic (iii) nine (iv) apparent (v) The Great Bear (Saptarshi) and Cassiopeia (Sharmishta)

2. A star rises at 8 pm tonight. At what time will it rise after a month? why?

Ans : The stars rise 4 minutes early next day. Therefore, after a month it will be 120 minutes or 2 hours earlier than tonight. Thus, the star will rise at 6 pm after a month.

3. What is meant by 'The sun enters a nakshatra' ? It is said that in the rainy season the sun enters the Mrug nakshatra. What does it mean ?

**Ans :** As the earth changes its position due to its revolution, a different constellation or raashi appears behind the sun every  $13^{\circ} 20'$ . But this is expressed as if sun has entered a particular raashi. So, when we say sun has entered Mrug nakshatra, actually Mrug constellation is behind the sun.

4. Answer the following questions.

(a) What is a constellation ?

**Ans :** A group of stars occupying a small portion of celestial sphere is called a constellation. Some of these stars appear to form certain animal or human figures and objects. These constellations are behind the sun.

(b) What points should be considered before a sky watch ?

**Ans :** All the equipments such as good quality binocular, telescope, the sky map, the compass to show directions are to be gathered before sky observation. The place for sky watching should be away from the city and illumination of city lights. The night for sky watching should be a new moon night for a darker sky.

(c) Is it wrong to say that the planets, stars and nakshatras affect human life? Why?

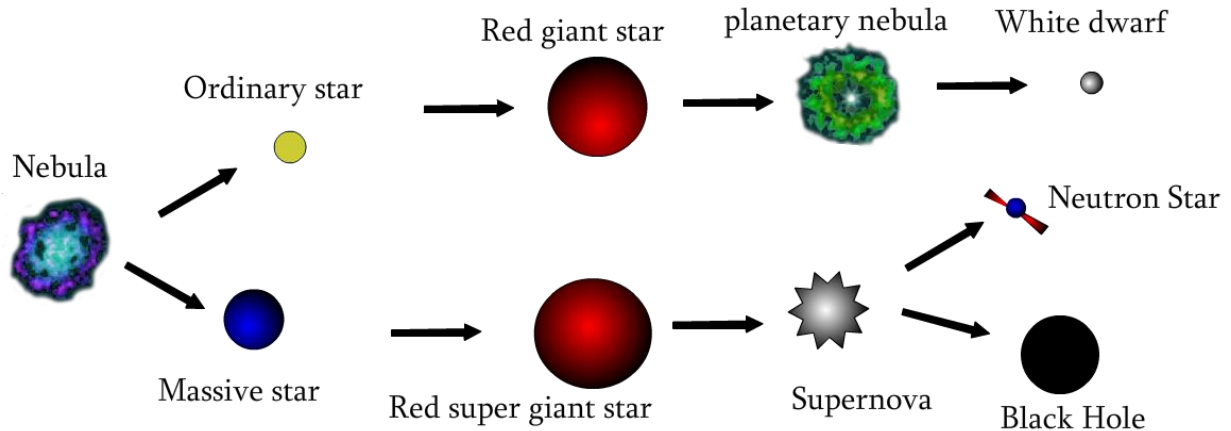
**Ans :** Distant stars, planets, comets or any constellation do not have any influence on human life. In the age of scientific and technological progress, man has stepped over the moon. Soon in this century man will step on the Mars too. Therefore, unless it is scientifically proved, we cannot say that stars, planets and celestial bodies have impact on human life.

(d) What points should be considered before a sky watch ?

**Ans :** All the equipments such as good quality binocular, telescope, the sky map, the compass to show directions are to be gathered before sky observation. The place for sky watching should be away from the city and illumination of city lights. The night for sky watching should be a new moon night for a darker sky.

5. Write a paragraph on the birth and lifecycle of stars using figure.

Ans



Stars are born out of nebulae. Nebulae are the clouds made up mainly of hydrogen gas and dust particles. The particles in this cloud are attracted toward each other due to the force of gravity. As a result, the cloud contracts and becomes dense and spherical in shape. At the same time, the pressure of the gas at the core of the cloud increases and the temperature rises tremendously. A large amount of energy is generated. Because of the tremendous rise in the temperature atomic disintegration takes place at the core of the cloud. A disc is formed around the core of the cloud. Gasses start emitting from the core of the cloud and a spherical star is formed. Later, processes such as contraction, expansion, rise in temperature, etc., bring about changes in the nature of the star. These changes occur over a very long period of time and constitute the lifecycle of the stars. The different forms of the stars at various stages during this life cycle are identified as different types of stars. The various stages involved in the evolution of

the star are classified as Nebula, Star, Red Giant, Red Dwarf, White Dwarf, Super Anova, Neutron star and Black hole.

#### 6. Why pole star is important in sky observation ?

Ans : Since Pole star occupies a position on the earth's axis passing through the north pole. Therefore, it always points the north in a sky map. The position of Pole Star can be also indicated by constellation of Saptarshi i.e the great bear on one side and Sharmishtha i.e. Cassiopeia on the other side.

#### 7. What is a relation between The Great Bear, Cassiopeia and Pole star?

Ans : The constellations of The Great Bear(Saptarshi) and Cassiopeia(Sharmishtha) are useful in locating the Pole star. Cassiopeia is made up of five bright stars which are distributed along the figure of the letter M. The perpendicular bisector of the line joining the third and fourth stars in Cassiopeia goes towards the Pole Star. The Great Bear is a group of seven bright stars. It is in the shape of quadrangle with a tail made up of three stars. It resembles a kite and can be easily recognized. If we extend one side of the quadrangle, it reaches the Pole star.

### 8. What are the names of twelve zodiac signs?

Ans : Aries, Taurus, Gemini, Cancer, Leo, Virgo, Libra, Scorpio, Sagittarius, Capricorn, Aquarius and Pisces are twelve zodiac signs.

### 9. Explain the following terms :

1) **Zenith** : As we stand under the sky, the point on the celestial sphere exactly above the head is called zenith.

2) **Nadir** : As we stand under the sky, the point on the celestial sphere exactly below our feet is called the nadir.

3) **Meridian** : The great astronomical circle which passes through both the celestial poles and the observer's zenith and nadir is called a meridian.