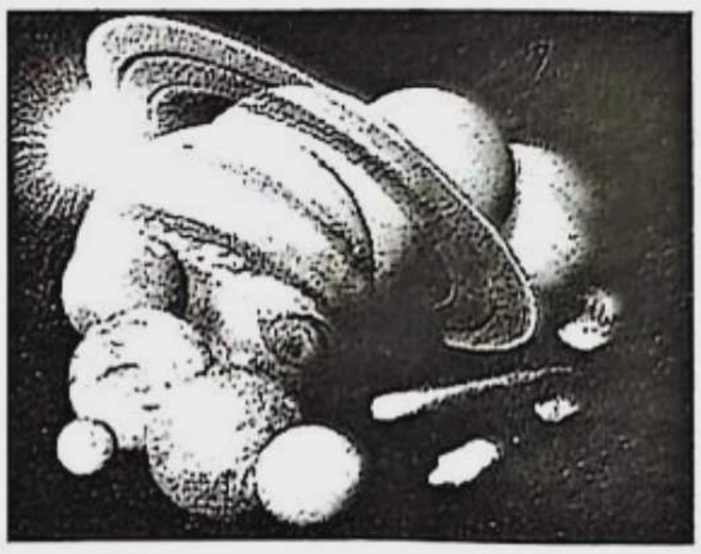
Chapter 12

The Outer Space and Satellites

Contents for Discussion

• The outer space • The Universe • Natural Planet or Satellite • Artificial Satellites and history of their development • The movement of an Artificial Satellite • The importance and uses of Artificial Satellites.



Learning Outcomes : After studying this chapter I will be able to–

- explain the outer space and the universe;
- explain natural and artificial satellites;
- explain the movement of satellites in the orbit;
- describe the uses and importance of artificial satellites;
- appreciate the benefits derived from artificial satellites.

Practice

Multiple Choice, Short & Creative Q/A following 100% accurate format for best prep.

Dear learners, the Q/A of this chapter have been divided into exercise, multiple choice, short, creative & exercise-based activities in light of the learning outcomes. Practice the questions well to ensure the best preparation in the exam.

Textual Q/A — Let's learn the textbook Q/A

Fill in the Blanks

1. — galaxies are wandering.
2. The objects revolving around the planets are called —.
3. The galaxy to which our solar system belongs is called —.
4. The human designed — are called artificial satellite.
5. The first woman to go to — is Valentina Tereshkova.

Ans. 1. In the outer space; 2. satellites; 3. Milky-Way; 4. satellites; 5. outer space.

Short Answer Questions

Question 1. What is the distinction between outer space and free space?

Ans. The space surrounding the earth is free space covering about 160 kilometres above the ground. There is air upto this level. Beyond this level is the outer space. The atmosphere is taken as a part of the earth and not as a part of the outer space. The outer space begins where the atmosphere ends.

Question 2. Explain the vastness of the Universe.

Ans. The vastness of the Universe is simply beyond imagination. It is quite a mystery even in this age of advanced technology. The universe includes everything that is observable in one way or another. The stars are huge spherical objects. They are millions of kilometres away and so they look tiny. The distances among them are so vast that they are measured in light years. Nine trillion kilometres make a single light year. Light travels 3 $\times 10^5$ km every second. It is miraculous but a fact that the rays of millions of stars have not yet reached the earth though they have been giving light for 13·75 billion years! The nearest star to the sun is Alpha Centario which is over four light years (9 × 4 million kilometres) away. There are numerous solar systems, galaxies, constellations, Milky-Way and nebulae in the universe; they all are so vast that the earth is simply a pin-point comparing to each of them.

Question 3. What is meant by galaxy? To which galaxy do we belong?

Ans. In the space, there are billions of stars. They are far apart from one another. They fall into numerous groups each of which is called a galaxy. The sun is one of the hundred billion stars of our galaxy. A part of the galaxy can be seen as a faint band of stars stressing across the sky. This band is called the Milky-Way that our planet belongs to.

Question 4. What is Solar System? What objects are there?

Ans. The galaxy our planet belongs to is called the Milky-Way where the sun is located along with its members, i. e. the planets. This family consisting of the sun and eight planets is called the solar system. The planets revolve around the sun. They are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Question 5. Why does the artificial satellites revolve around earth?

Ans. For the orbital motion of a satellite around the earth, there must be a centripetal force working inward. This force comes from the earth's gravitational attraction. The calculation shows that launching a satellite into an orbit round the earth needs a speed of about 8 km/sec. The speed is inereased stage by stage because at lower atmosphere the air friction is larger for the higher density of air. This can create enormous heat and burn the rocket.

Question 6. Satellites serve many useful purposes — explain.

Ans. Satellites are used for the purposes like instant and detailed communication, forecasting weather condition, observing earth surface accurately, military affairs including detecting the position of enemies, navigational affairs and observing the objects in the sky.

Let us suppose, a massive low pressure of air has taken place in the middle of a sea and is rushing to hit the coast. Since we get the image and direction of the disaster, we can take necessary steps to save our lives and properties.

By dint of satellites, we can immediately come to know whether a ship is sinking in the deep sea or it is polluting the sea by spilling petroleum. Satellites work as relay stations and so people can see what are going on in all the countries of the world on TV screens.

Satellites have brought a new dimension to the era of life and technology.

MCQs with Answers

1. How many satellites are there in Jupiter?

ⓓ ⓐ 14 ⓑ 27 ⓒ 62 ⓓ 67

» **Explanation :** Planets and satellites do not produce any light or heat. Sunlight falls on them and is reflected. Earth has 1, Mars has 2, Jupiter has 67, Saturn has 62, Uranus has 27 and Neptune has 14 natural satellites.

2. Galaxy is —.

i. a vast number of stars in the universe which are bound by the gravitational force.
ii. the empty space between the planets and the stars.
iii. the heavenly objects that revolve around a star.

Which of the following is correct?

ⓒ ⓐ i ⓑ ii ⓒ i & iii ⓓ ii & iii

» **Explanation :** The parts of the universe where matter or objects are more concentrated are called galaxies or so star systems. A galaxy is a large group of planets and stars.

Answer the questions no. 3 and 4 according to the table given below :

Artificial Satellite	Function
M	Determining the presence of ice-berg along the path of the ship.
N	Determining the position of a plane in the sky.
O	Exploring unknown information about the Universe.
P	Gathering information about the insects attacking crops by photography.

3. Which is the satellite N?

ⓐ Communication Satellite
ⓑ Navigation Satellite
ⓒ Astronomical Satellite
ⓒ ⓓ Earth Observation Satellite

4. Based on the uses given in the table which two satellites are of the same type?

ⓐ ⓐ M & N ⓑ N & O ⓒ O & P ⓓ M & P

Creative Questions with Answers

Ques. 01 The merchant Baker heard through radio from a fishing boat that cyclone is likely to come in the south of the Bay of Bengal. It can hit the shore at any moment. At the Cox's Bazaar coast danger signal 3 is announced and fishing boats are asked to stay at the shore.

a. What is artificial satellite? 1
b. What do you understand by the term Universe? 2
c. Where from the radio office got the information about the cyclone? How the merchant is benefited? 3
d. How can the news warn the merchant Baker and the coastal people? Give explanation. 4

Answer to Question No. 01 :

a An artificial satellite is a space vehicle designed to orbit a large body, usually the earth.

b According to the presently accepted opinion of the scientists, the universe is everything that is observable in one way or another. The universe is the name given to the totality of everything we know about — stars, planets, galaxies, nebulae and so on. Everything on earth, from tiny bits of dust to the highest mountain, also everything in space and all the billions of stars in the billions of galaxies form the universe.

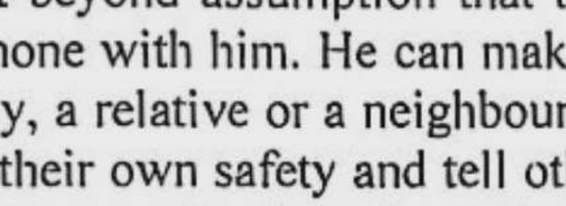
c The radio office got the information about the cyclone from the weather satellite.

The merchant was in his fishing boat far away from the coast. He was fishing there as usual. He knew nothing about the cyclone which was proceeding towards the coast. If he did not hear the

fact, he might have lost his boat and even his life. He might also have lost the members of his family, relatives and neighbours who were living in the coastal areas and their belongings. Now he can escape all these massive losses. This is how the merchant was benefitted.

d It is not beyond assumption that the merchant has a cellphone with him. He can make phonecalls to his family, a relative or a neighbour so that they can ensure their own safety and tell others to leave the place for a safe place including the while-disaster resorts. Let us suppose, the merchant does not have any cellphone but a wireless set. With this set, he can warn the coastal people in the same way. Let us suppose, he does not have even a wireless set. Now he can start the engine of his boat (all the sea bound fishing boats have engines) at a high speed to reach the coast as early as possible.

Ques. 02



a. What is outer space? 1
b. What is the difference between the moon and an artificial satellite? 2
c. What type of satellite is P? 3
d. Give a comparative discussion on P, Q and R satellites. 4

Answer to Question No. 02 :

a The space beyond the atmosphere that begins after 160 kilometre above the ground is called the outer space.

b An artificial satellite is a space vehicle designed to orbit a large body, usually the earth. The moon is not a space vehicle but a natural satellite of the earth. The moon attracts the earth and causes tide and ebb. An artificial satellite can neither attract the earth nor cause tide and ebb. In comparison to the moon, an artificial satellite is a tiny object.

c P is a not a satellite. It is the sun while Q is the earth and R is the satellite of the Q. P along with its family members is located in the galaxy named Milky-Way. The sun's family or the solar system consists of the sun itself and its eight members. Each of the member is called a planet. The eight planets are the Mercury, the Venus, the Earth, the Mars, the Jupiter, the Saturn, the Uranus and the Neptune.

d What comes first is that P, Q and R belong to the solar system which again belongs to the same galaxy called the Milky-Way. The sun is one of hundred billion stars of our galaxy. Part of the galaxy can be seen as a faint band of stars stressing across the sky. This band is called the Milky-Way. The earth is one of the eight planets of the sun while the moon is the only satellite of the earth. The earth revolves around the sun. The earth is 150 million kilometres away from the sun while the moon is 3,84,000 kilometres away from the earth. The moon revolves round the earth. The sun radiates light and heat but the moon does not have light of its own. Both the earth and the moon are lighted by the sun's light.

Multiple Choice Q/A Designed as per topic

Lesson 1 : The outer space

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1. What is called to the thing shown by Raju's father? *(Application)*
ⓐ Planet ⓑ Star
ⓓ ⓒ Artificial Satellite ⓓ Satellite

2. From how much km above the ground, the outer space begins, where atmosphere ends? *(Knowledge)* *[SB '17]*
ⓑ ⓐ 161 ⓑ 160 ⓒ 155 ⓓ 150

3. Which is taken as a part of outer space? *(Knowledge)* *[DB '15]*
ⓐ Planet ⓑ Atmosphere
ⓐ ⓒ The Milky-Way ⓓ Earth

Lesson 2: The Universe

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4. Galaxies —. *(Comprehension)*
i. Proxima Centauri ii. Andromeda
iii. Milky-Way
Which one of the following is correct?
ⓑ ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

5. Which of the following has its own light? *(Comprehension)* *[CB '19]*
ⓐ Planet ⓑ Star
ⓑ ⓒ Artificial satellite ⓓ Natural satellite

6. Big Bang —. *(Comprehension)* *[SB '18]*
i. happened about 12.75 billion years ago
ii. by this theory, any one get concept about the creation of universe
iii. Scientist Einstein give logic on favour of this theory
Which one of the following is correct?
ⓒ ⓐ i ⓑ ii ⓒ i & ii ⓓ ii & iii

7. Which scientist give logic in favour of the Big Bang? *(Knowledge)* *[SB '17]*
ⓐ Newton ⓑ Ritherford
ⓒ ⓒ Stephen Hawking ⓓ Democritus

8. Which one of the following has it own light? *(Knowledge)* *[SB '17]*
ⓐ ⓐ Star ⓑ Earth ⓒ Mercury ⓓ Moon

9. **What is the speed of light?** *(Knowledge)* *[Ideal School & College, Dhaka]*
ⓐ 3×10^8 ms^{-1} ⓑ 3×10^9 ms^{-1}
ⓐ ⓒ 0.3×10^8 ms^{-1} ⓓ 0.03×10^8 ms^{-1}

10. **What is the approximate time sunlight need to reach the earth's surface?** *(Knowledge)* *[Ideal School & College, Dhaka]*
ⓐ 500 sec ⓑ 520 sec
ⓐ ⓒ 560 sec ⓓ 570 sec

11. **What is the colour of the biggest stars?** *(Application)* *[Ideal School & College, Dhaka]*
ⓐ Red ⓑ Blue
ⓑ ⓒ Yellow ⓓ Indigo

12. **What is the age of Universe?** *(Application)* *[Viqarunnesa Noon School & College, Dhaka]*
ⓐ 1300 crore year ⓑ 1330 crore year
ⓓ ⓒ 1350 Crore year ⓓ 1375 crore year

13. **The Big Bang Theory is based on the available evidence of —.** *(Comprehension)*
i. the age of the universe
ii. the helium abundance
iii. the temperature of the background radiation
Which one of the following is correct?
ⓓ ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

Lesson 3 : Natural Planet or Satellite

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14. **If the solar system is a family, who is the chief of it?** *(Knowledge)*
ⓐ the earth ⓑ the sun
ⓒ the moon
ⓑ ⓓ the gravitational force

15. **Which is the brightest planet of the solar system?** *(Knowledge)*
ⓐ the Uranus ⓑ the Venus
ⓑ ⓒ the Neptune ⓓ the Jupiter

16. **Which planet lies nearest to the sun?** *(Knowledge)*
ⓐ the Venus ⓑ the Mercury
ⓑ ⓒ the Saturn ⓓ the Mars

17. **How many planets do not have any satellite?** *(Knowledge)*
ⓓ ⓐ five ⓑ four ⓒ three ⓓ two

18. **How many natural satellites are there in the solar system?** *(Knowledge)*
ⓐ ⓐ 140 ⓑ 130 ⓒ 120 ⓓ 110

19. **What is the position of the Mars with respect to the number of satellites?** *(Comprehension)*
ⓐ ⓐ fourth ⓑ fifth ⓒ sixth ⓓ seventh

20. **How many satellites does the Saturn have?** *(Knowledge)*
ⓒ ⓐ 13 ⓑ 27 ⓒ 34 ⓓ 43

21. **Which planet ranks the third position with respect to the number of satellites?** *(Comprehension)*
ⓐ the Uranus ⓑ the Neptune
ⓐ ⓒ the Jupiter ⓓ the Saturn

22. **How many satellites does the Uranus have?** *(Knowledge)*
ⓑ ⓐ 13 ⓑ 27 ⓒ 34 ⓓ 36

23. **How many satellites does the farthest planet have?** *(Higher Ability)*
ⓒ ⓐ 36 ⓑ 27 ⓒ 13 ⓓ 02

24. **Planets having no satellite —.** *(Comprehension)*
i. the Murcury
ii. the Venus
iii. the Saturn
Which one of the following is correct?
ⓐ ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

25. **Which planet of the solar system has the third highest number of satellites?** *(Comprehension)* *[DB '19]*
ⓑ ⓐ Saturn ⓑ Neptune ⓒ Jupiter ⓑ Urenus

26. **Which planet has 27 satellites?** *(Comprehension)* *[RB '19]*
ⓐ Jupiter ⓑ Saturn
ⓒ ⓒ Uranus ⓓ Neptune

27. **Which planet has 67 satellites?** *(Knowledge)* *[CtgB'19]*
ⓐ ⓐ Jupiter ⓑ Saturn ⓒ Uranus ⓓ Neptune

28. **Which planet has maximum satellites?** *(Comprehension)* *[SB '19]*
ⓑ ⓐ Saturn ⓑ Jupiter ⓒ Uranus ⓓ Neptune

29. **What is the next planet of earth in solar system?** *(Knowledge)* *[BB '19]*
ⓐ Uranus ⓑ jupiter
ⓒ ⓒ Mars ⓓ Saturn

30. **Which planet has the highest number of satellites?** *(Comprehension)* *[MB '19]*
ⓐ Mars ⓑ Earth
ⓒ ⓒ Uranus ⓓ Neptune

Read the stem below answer the question No. 31 and 32 :
Raju's father showing Raju a bright thing tells him that this thing is moving centering the earth. There are more 7 things like the earth moving centering the sun. These things have no light and heat of their own. *[DB '18]*

31. **What is called to the thing shown by Raju's father?** *(Application)*
ⓐ Planet ⓑ Star
ⓓ ⓒ Artificial Satellite ⓓ Satellite

32. **Which has no light and heat of its own?** *(Knowledge)*
i. The sun
ii. The Uranus
iii. The Sputnik
Which one of the following is correct?
ⓒ ⓐ i & ii ⓑ i & iii ⓒ ii & iii ⓓ i, ii & iii

33. **How many natural satellites are there in the Uranus?** *(Knowledge)* *[RB '18]*
ⓑ ⓐ 14 ⓑ 27 ⓒ 62 ⓓ 67

34. **How many satellites does the Neptune have?** *(Knowledge)* *[JB '18]*
ⓑ ⓐ 2 ⓑ 14 ⓒ 27 ⓓ 62

Science

35. **Which planet has the highest number of natural satellites?** *(Comprehension)* *[CB '18]*
ⓐ Neptune ⓑ Mars
ⓒ Jupiter ⓓ Uranus

Lesson 4 : Artificial Satellites and history of their development
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36. **Who was the first human being to travel the space?** *(Knowledge)*
ⓐ Michael Collins ⓑ Neil Armstrong
ⓓ ⓒ Eduin E. Aldrin ⓓ Yuri Gagarin

37. **How many artificial satellites are on work in the space right now?** *(Knowledge)*
ⓐ less than 2500 ⓑ more than 2500
ⓐ ⓒ exactly 2500 ⓓ innumerable

38. **What does the Russian word 'Sputnik' mean?** *(Knowledge)*
ⓐ the space ⓑ a scientist
ⓓ ⓒ an aircraft ⓓ a journey mate

39. **What year was the first international communication satellite initiated in the space in?** *(Knowledge)*
ⓑ ⓐ 1970 ⓑ 1975 ⓒ 1980 ⓓ 1985

40. **Communication satellites —.** *(Knowledge)*
i. Intelset–1
ii. Appolo Souz
iii. Vostok–6
Which one of the following is correct?
ⓐ ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

■ **Read the following passage and answer the question numbers 41 and 42 :**
Mitu is enjoying a movie on the Second World War. She is horrified to land attacks, naval attacks and air attacks and death toll of millions of lives. She also sees a special types of rocket.

41. **Which country designed the rocket?** *(Knowledge)*
ⓐ Germany ⓑ USA
ⓐ ⓒ USSR ⓓ UK

42. **Rockets are used in —.** *(Comprehension)*
i. propelling other rockets
ii. lifting up artificial satellites
iii. carrying lunar modules
Which one of the following is correct?
ⓑ ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

43. **Which one is the first artificial satellite for remote sensing?** *(Knowledge)* *[M.B.-'19]*
ⓐ Appolo souz ⓑ Cand set-1
ⓑ ⓒ Vostok-1 ⓓ Explorer-1

44. **The Artificial satellite which is first sent in the outer space is —.** *(Knowledge)* *[CtgB '18]*
ⓐ Landset-1 ⓑ Explorer-1
ⓒ ⓒ Sputnik-1 ⓓ Vostok-1

Lesson 5 : The movement of an Artificial Satellite
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45. **What is needed in order to revolve around the earth?** *(Comprehension)* *[BB '18]*
i. centripetal force
ii. attraction force
iii. gravitational attraction force
Which one of the following is correct?
ⓒ ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

46. **Artificial satellite stationary with respect to earth requires how much time to complete one revolution around earth?** *(Knowledge)* *[JB '16]*
ⓐ 8 minutes ⓑ 24 hours
ⓑ ⓒ 30 days ⓓ 1 year

Lesson 6-7 : The importance and uses of Artificial Satellites
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47. **What type of satellite is used to detect the position of aeroplane?** *(Comprehension)* *[CB '19]*
ⓐ Communication satellite ⓑ Navigation satellite
ⓑ ⓒ Weather satellite ⓓ Military satellite

48. **Which satellite helps to watch the "World Cup Cricket-2019"?** *(Knowledge)* *[BB.'19]*
ⓐ Communication satellite
ⓑ Weather satellite
ⓒ Military satellite
ⓐ ⓓ Earth observation satellite

49. **The satellite included in artificial satellite is—** *(Comprehension)* *[Din.B.-'19]*
i. weather satellite
ii. military satellite
iii. navigation satellite
Which one is correct?
ⓓ ⓐ i & ii ⓑ i & iii ⓒ ii & iii ⓓ i, ii & iii

50. **Which is the function of the earth observation satellite?** *(Comprehension)* *[Ctg.B.-'19]*
ⓐ Locate the exact positions of planes on the sky
ⓑ Observe the possible leakage of oil from ships in the sea
ⓒ Observe the space where the cloud is formed
ⓑ ⓓ Support to relay the radio signal

51. **To watch the World Cup Football of Russia which Satellite was used?** *(Knowledge)* *[DB '18]*
ⓐ Communication Satellite
ⓑ Weather Satellite
ⓒ Military Satellite
ⓐ ⓓ Earth Observation Satellite

52. **Which one help to know about in the position of iceberg in the way of ship?** *(Comprehension)* *[CB '18]*
ⓐ Earth observation satellite
ⓑ Military satellite
ⓓ ⓒ Navigation satellite ⓓ Weather satellite

53. **By which satellites we can watch Russia World Cup-2018?** *(Knowledge)* *[SB '18]*
ⓐ Communication ⓑ Weather
ⓐ ⓒ Earth Observation ⓓ Astronomical

54. Earth observation satellite —. *(Knowledge)* *[DjB '18]*

i. determining the presence of ice-berg along the path of the ship
ii. gathering information about the insects attacking crops by photography
iii. weather forecast advance situation

Which one of the following is correct?

ⓐ ⓐ i & ii ⓑ i & iii ⓒ ii & iii ⓓ i, ii & iii

55. The path of cyclone is seen by which satellite? *(Knowledge)*
[Ilqarunnesa Noon School & College, Dhaka]

ⓐ Communication ⓑ Weather
ⓑ ⓒ Earth Observation ⓓ Astronomical

Short Q/A Designed as per topic

Lesson 1 : The outer space

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Question 1. What are celestial objects? Explain.
Ans. The Sun, the Moon, planets, stars, space, galaxies, comets etc., visible and invisible things all comprise our universe. Everything in the universe is called celestial object.

Question 2. Why is the atmosphere considered a part of the earth?
Ans. The atmosphere of the earth rotates along with it. This is why the atmosphere is taken as a part of the earth and not as a part of outer space.

Question 3. Where does space begin?
Ans. The greater portion of the atmosphere exists near the earth. The air surrounding the earth gets thinner as you go upwards until there is none. When we go about 160 km above the ground, the space becomes almost empty. Most scientists believe that the atmosphere ends, and space begins at an altitude of 160 km above the Earth.

Lesson 2: The Universe ▸ Textbook Page 126

Question 4. What is a comet? Explain.
Ans. Sometimes one kind of astrological body appear in space which has head and tail. The astrological body is called comet. It is one of the most amazing astrological bodies in the sky. Although comet lives in the solar system, it appears for a few days and disappears again.

Question 5. Write two characteristics of comets.
Ans. Two characteristics of comets are–
1. They have a head and a tail.
2. They travel far around the sun.

Question 6. Mention two characteristics of galaxies.
Ans. Two characteristics of galaxy are mentioned below–
1. A galaxy is a large group of planets and stars.
2. Galaxies move through space.

Question 7. What does star mean?
Ans. The astrological bodies in the universe that have their own light and are large and twinkling are called stars. Such as the Sun, the pole star, etc.

Question 8. Write two characteristics of stars.
Ans. Two characteristics of stars are–
1. Stars have their own light and heat.
2. They are large and twinkling.

Question 9. What is the colour of star?
Ans. The stars of the universe are divided into different colours like red, blue, yellow etc. according to the intensity of their light. Supermassive stars are red, medium stars are yellow, and small stars are blue.

Question 10. Mention the Big Bang Theory.
Ans. Among the theories about the origin and development of the universe, the Big Bang Theory is widely known. According to this theory, the universe was once extremely hot and infinitely dense at a single point. According to the Big Bang theory, the universe spontaneously expanded very rapidly. The rapid expansion caused the universe to cool and reach its present expanding state.

Lesson 3 : Natural Planet or Satellite

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Question 11. How many planets are there in the solar system and what are they?
Ans. There are 8 planets in the solar system. Their names are-1. Mercury, 2. Venus, 3. Earth, 4. Mars, 5 Jupiter, 6. Saturn, 7. Uranus and 8. Neptune.

Question 12. What does planet mean?
Ans. Large objects that revolve around the sun are called planets. The eight planets orbiting the sun are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Question 13. Write two characteristics of planets.
Ans. Two characteristics of a planet are–
1. It travels in a fixed orbit around the sun.
2. There is enough mass in a planet.

Question 14. Write two differences between planets and satellites.
Ans. Two differences between planets and satellites are–

Planet	Satellite
1. Planets revolve around the Sun.	1. Satellites revolve around the planet.
2. Planets are large.	2. Satellites are smaller in size.

Question 15. Why is the Moon called the earth's satellite?
Ans. The Moon is called a satellite of earth, because–
1. The Moon revolves around the earth.
2. It is attracted by Earth's gravity.
3. It is in a stable orbit with the Earth.
4. It has no light of its own, it receives light from the earth.

Question 16. Why is the moon not a part of the earth?
Ans. The Moon is not a part of the Earth. Because it is attracted by the Earth's gravitational force but is not attached to the Earth's crust. The moon is an independent object that revolves around the earth.

Question 17. What will happen if there is no moon?
Ans. Moon is a satellite of the Earth. If the moon suddenly disappears from the earth, there will be a change in the pattern of ebb-tide of the oceans. The Earth would spin on its axis faster than it currently does. As a result, the time of day and night will decrease. Not only that, without the moon, the night would be much darker.

Question 18. How are satellites created?
Ans. Astronomers think that a few cosmic clouds revolved around a star when the planet was born. They condense due to the force of gravity and eventually solidify and transform into planets. In this way, again satellites are formed around the planet.

Lesson 4 : Artificial Satellites and history of their development

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Question 19. Write the names of two artificial satellites.
Ans. The names of the two artificial satellites are-
1. Sputnik-1 and 2. Vostok-1.

Question 20. Write two characteristics of artificial satellites.
Ans. Two characteristics of artificial satellites are–
1. They are launched with the help of rockets.
2. Like the moon, they move in their own orbit under the influence of the earth's gravity or gravitational force.

Lesson 6–7: The importance and uses of Artificial Satellites

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Question 21. What is the use of artificial satellites?
Ans. An artificial satellite is a device or object, which is man-made. It is placed in the Earth's orbit or in the orbit of another planet. It usually revolves around the Earth or another planet and is used for various purposes, such as communication, weather observation, navigation, scientific research, etc.

Question 22. Why is the Earth observation satellite important in the field of environment?
Ans. Earth observation satellites can provide clear images of the Earth's surface. These satellites can send information and pictures of which fields are doing well, which crops are affected by diseases or insects. Also, it can be known with the help of this satellite that which ship is leaking oil in the sea and where it is polluting the environment, which city's air is polluted and dirty.

Question 23. Mention the uses of artificial satellites in the field of intelligence.
Ans. The satellites used by the military for intelligence work are known as intelligence satellites. These satellites are used to gather information about where the enemies are hiding, whether they are secretly infiltrating anywhere; whether there is any secret attack or not.

Creative Q/A Designed as per learning outcomes

Ques. 01 Ratul's father was watching news on CNN channel last night. Ratul's mother got angry at this because she was missing a drama serial on another channel. Ratul told his father to buy him another TV set on the ground that he was often missing his favourite programmes like horror movies, action movies, entertainment programmes, etc. on different channels.

a. What is the distance between the earth and the moon? 1
b. CNN is an American channel. How is it possible to watch it in Bangladesh? 2
c. State the contributions of satellite technology. 3
d. "In case of Bangladesh, satellite technology is at the same time a satellite aggression."– Evaluate the statement. 4

Answer to Question No. 01 :

a The distance between the earth and the moon is 3,84,000 kilometres.

b Though CNN is an American channel, it is possible to watch it in Bangladesh or any other part of the earth by dint of communication satellite. From the CNN headquarters, a signal in the form of a radio wave is sent through a dish antenna to an artificial satellite. The satellite transmits the signal to the receiving country. It then reaches the screens of the TV sets either having dish antennas or connected to a dish line.

c Satellite technology has made tremendous contributions to all walks of people of the world irrespective of a fisherman or a NASA scientist. Children have discovered a vast expanse of cartoon programmes. Fishermen busy with fishing in the deep sea and the coastal people can rush to a safe place when they hear a danger signal. Not a single ship or an aircraft will no more be lost in a sea or a dense forest escaping the notice of the satellites.

Satellites have make an easier way to find minerals, detect pollution, pests, military attack as well as the movement of space bodies. Satellites enable us to know what is going on across the globe every moment. It enriches our skill and knowledge.

d We are a distinct nation with a distinct identity, a millennium old cultural heritage, a refined mode of life and so forth. We live in the postmodern world where everything is possible and nothing is certain. In respect with culture, it is the age of aggression. The nation is compelled to lose itself in a massive quicksand.
Rock, band, catwalk, ramp, disco and many other evil styles have already grasped the young people even in their dress pattern and hairstyle. Today, a singer means a figure as terrific as a terrorist or a mythological demon. This is the ultimate outcome of blind copying of cultural aggression, mostly derived from satellite channels. This is a single example of severe moral degradation of the juvenile and young people. There are at least one hundred instances of such degradation that are sapping into the vitality of family value and moral value — the root of Bangalee identity.

Science

Ques. 02

Artificial Satellites	Work
A	Observe the possible leakage of oil from ships causing pollution.
B	To see the ICC World Cup-2019 which is held in England.

a. What is called by outer space? 1
b. Why the Earth enlighted? 2
c. Explain the working activity of 'A'. 3
d. Analyze there is a similarity between the natural satellite of the planet which is situated in the third orbit of the solar system and B, but their activity is different. 4

● *Chattogram board 2019, Rajshahi Board 2019*

Answer to Question No. 02 :

a The outer space is mostly empty in which the material objects in different forms are moving in their respective paths.

b The earth is one of the planets of solar system. Earth does not have its own light. But from the outer space our earth looks bright like other planets due to the sunlight reflected from their surface.

c In the stem, 'A' represents 'Earth observation satellite'. These satellites can give us clean pictures of earth's surface. Because it can take photographs from high altitude and can observe the position of the ships in the sea and possible leakage of oil from ships causing pollution. They can observe the fields of crops over vast areas and find out where crops are growing well and where there is invasion of insects. Earth observation satellites are also used for discovering minerals and locate mountains and forests with great accuracy.

d The planet which is situated in the third orbit of the solar system is earth. The moon is the natural satellite of earth. On the other hand, 'B' is artificial satellite or a communication satellite.
An artificial satellite is much smaller than the moon and moves in a much smaller orbit. For every orbit there must be a definite outward centrifugal acceleration of the satellite to balance the inward attraction due to gravity. For this the velocity of a satellite is smaller when its distance from the earth is larger. It then takes more time to complete one revolution round the earth.
We watch different cultural functions and games like World Cup or Olympic Games held in various countries through artificial satellites. It works in the same way where the signal is first sent to a satellite from a dish antenna which in its turn send it to our dish antenna. Finally the information is shown in our television. Here the satellite works as a relay station. This satellite carries television program and telephone news from one end of the earth to other end. For this reason the name of it is communication satellite.
So, the activity of moon (natural satellite) and artificial satellite is different.

Ques. 03 'X'-Human launched satellite.
'Y'- The satellite of earth.

a. What is Milky-way? 1
b. Explain the incident of Big Bang. 2
c. Describe the spin motion of satellite 'Y'. 3
d. What is die role of the satellite 'X' in human life? Analyze. 4

● *Sylhet Board 2019*

Answer to Question No. 03 :

a Our Solar System consists of the sun at the centre and with eight of its plantes and 41 satellites of its planets. A galaxy consists of millions of celestial bodies like our solar system. Out of innumerable galaxies in the space, the particular galaxy which includes our solar system is known as the Milky-way.

b From the available evidence on the age of the universe, Astronomers think that the Universe started with a massive explosion, this is called Big Bang Theory. It happened about 13.75 billion years ago. A huge explosion sent everything racing outwards in all directions. Before the Big Bang everything was packed incredibly close together to a point of high temperature and density. Over time it has expanded into the Universe we see today.

c Satellite 'Y' of the stem is moon. A smaller body orbiting a larger one, usually a planet is called a satellite. The moon is a natural satellite of our earth.

Scientists think that the sun, the planets and their satellites are formed from a huge cloud of gas and dust. A star near the cloud exploded, making the cloud spin. As the loud spun around and stuck together to form lumps. In that time the stars crashed into each other and that formed satellites. The cloud in the same way gathered into lump around the planets to form their satellites.

For the orbital motion of a satellite around the earth there must be a centripetal force working inwards. This force comes from the earth's gravitation of attraction.

d 'X' satellite of the stem is artificial satellite. Artificial satellites are used for different purposes. The role of artificial satellite in human life is described below –

Earth observation satellite :

These satellites can give us clean pictures of earth's surface. Because it can take photographs from high altitude and can observe the position of the ships in the sea and possible leakage of oil from ships causing pollution. They can observe the fields of crops over vast areas and find out where crops are growing well and where there is invasion of insects. Earth observation satellites are also used for discovering minerals and locate mountains and forests with great accuracy.

Communication satellites : Telephonic message in the form of radio wave is sent through a dish antenna to an artificial satellite. The satellite transmit the said signal to the antenna of the receiving country from where it reaches to the person concern.

In the same way different cultural functions and games are watched in various countries artificial satellites.

Weather satellites : These satellites transmits images of weather and earth's environment. So, weather forecast is possible about rainfall, wind and cyclone is possible in advance.

These satellites give us clean pictures of earth's surface and observing that pictures we can get the idea of the position of ships, leakage of ships, crops, position, invasion of insects, discovering minerals, etc.

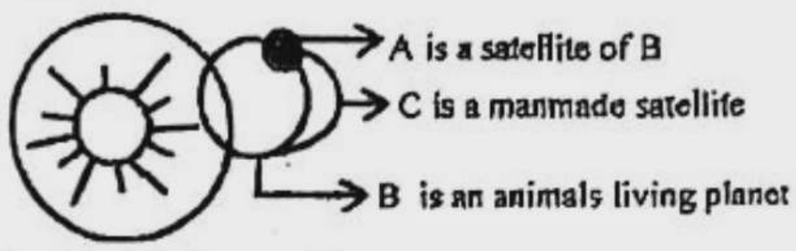
Military satellites : These are used to locate the enemy positions and to find out whether the energy take the opportunity to attack.

Navigation satellites : These are used to locate the exact positions of vehicles.

Astronomical satellite :

Astronomical satellites are used to observe the planets, stars galaxies and all objects in the sky by carrying telescopes much above the atmosphere.

Ques. 04



a. What is Universe? 1

b. How do we watch the world cup cricket game in television? 2

c. Explain how does the figure- 'A' is revolving around 'B'? 3

d. The importance of 'C' in modern life is immense— Analyse the statement. 4

● *Dinajpur Board 2019*

Answer to Question No. 04 :

a The body composed of the sun, the moon, the planets, the stars, the Milky-way, the galaxies, the outer space and all other celestial bodies is called the universe.

b We can watch the games held in different countries of the world on the television through artificial satellite. For this, a signal in the form of a radio wave is sent through a dish antenna to an artificial satellite. The satellite transmits the signal to the receiving country. It then reaches the screens of the TV sets either having dish antennas or connected to a dish line. Here the satellite works as a relay station.

c A refers to the natural satellite moon and B refers to the planet earth. The earth has only one natural satellite named moon. The moon revolves around the earth in a particular orbit. For the orbital motion of a satellite around the earth, there must be a centripetal force acting inwards. This force comes from the earth's gravitational attraction. Natural satellite moon revolves around the earth due to gravitational force of attraction.

d According to the stem, C refers to the artificial satellites. There satellites play an important role in various sectors. The useful applications of artificial satellite are described below–

Communication purpose : To communicate over a cell phone, communication satellites are used. Telephonic message in form of radio wave is sent through a dish antenna to an artificial satellite. The satellite receives the signal and transmit it to the antenna of receiving country from it reaches the person concern.

Weather purpose : Weather satellites are used to send image of the weather and environment. In this way, weather forecast is possible.

For defense purpose : Military satellites are used by governments to locate the enemy positions and to find out whether the enemy take the opportunity to attack.

To know the exact location : Navigation satellites are used to locate the exact positions of vehicles.

Ques. 05

Artificial Satellite Function

P → Talking over mobile
Q → Collecting image of invasion of insects
R → Forecasting about rain and storm
S → Knowledge about the space

a. What is called space? 1
b. There is beginning of space but no end — Explain. 2
c. How is P activated to move around the earth? — Explain. 3
d. Among the satellites mentioned in the stem which are more important for human life? — Analyze. 4

● *Mymensingh Board 2019*

Answer to Question No. 05 :

a The space beyond the atmosphere that begins after 160 kilometers above the ground is called the outer space.

b The Universe is comprised of all existing matters and space as a whole. The outer space begins where atmosphere ends. Although space itself is almost empty, there are many exciting things out there such as planets, stars and galaxies. Space is infinite in its extension. So, there is beginning of space but no end.

c 'P' of the stem is artificial satellite. The movement of an artificial satellite around the earth is described below–

For the orbital motion of a satellite around the earth there must be a centripetal force working inwards. This force comes from the earth's gravitational attraction. The calculation shows that to launch a satellite into an orbit round the earth a speed of about 8 kilometer per second is needed. This speed is achieved by using a multi-stage launching system. As the first stage motor uses up its fuel, it drops off. So the second stage rocket does not carry its weights. The speed is increased stage by stage because at lower atmosphere the air friction is larger for the higher density of air. This can create enormous heat and bum the rocket.

d 'P' of the stem is communication satellite, 'Q' is earth observation satellite, 'R' is weather satellite and 'S' is astronomical satellite. Among these, communication satellite and weather satellite are more important for human life. It is analyzed below–

Communication Satellites :

We often communicate with the outside world over telephone. When we use the telephone the signal is sent through a dish antenna a radio wave to an artificial satellite. The satellite transmits the radio signal to the antenna of the receiving country. From there it reaches the telephone of the person with whom we are talking.

We also watch different cultural functions and games like World Cup or Olympic Games held in various countries through artificial satellites. It works in the same way where the signal is first sent to a satellite from a dish antenna which in its turn send it to our dish antenna. Finally the information is shown in our television. Here the satellite works as a relay station.

Weather Satellites :

These satellites transmit images of the weather and earth's environment. They helped to show that the ozone layer was being depleted. The news that we get through radio, television and newspaper are obtained by the use of weather satellites. It is due to weather satellites the weather forecast is possible about rainfall, wind and cyclone is possible quite in advance.

Ques. 06

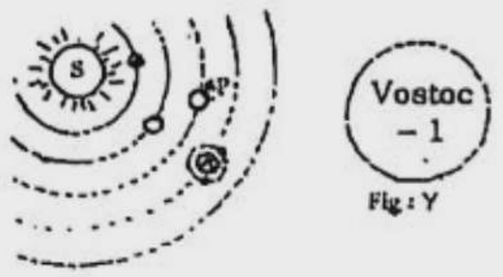


Fig : Y

a. What is outer space? 1
b. Why can we know the news of rainfall, wind and cyclone of the next days? 2
c. Describe the method of revolving of the figure Y in the orbit. 3
d. "Among the members of 'S' family" the number of satellites of P is fewer".– Analyse. 4

● *Chattogram Board 2018*

Answer to Question No. 06 :

a The space beyond the atmosphere is called outer space.

b We can know the news of rainfall, tsunami and cyclone of the next days using weather satellites. These satellites transmit images of those probable disasters. They helped to show that the ozone layer was being depleted. The news that we get through radio, television and newspaper are obtained by the use of weather satellites. By means of weather satellites the weather forecast is possible.

c Vostok-1 is an artificial satellite. The movement of an artificial satellite is described below :
For the orbital motion of a satellite around the earth there must be a centripetal force working inwards. This force comes from the earth's gravitational attraction. The calculation shows that launching a satellite into an orbit round the earth a speed of about 8 kilometer per second is needed. This speed is achieved by using a multi-stage launching system. As the first stage motor uses up its fuel, it drops off. So the second stage rocket does not carry its weights. The speed is increased stage by stage because at lower atmosphere the air friction is larger for the higher density of air. This can create enormous heat and bump the rocket.

d In this Milky-Way the sun is located along with its family members. They together form the solar system where 8 planets are revolving the sun. These planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune. Some of the planets have more than one satellite. The objects which revolve around the planets are called satellites. For example the moon is revolving round the earth and earth's satellite.
The planets and satellites do not radiate light or heat because they are not big enough to start nuclear reaction as happened in stars. The earth has 1 satellite, Mars has 2 satellites, Jupiter has 67 satellites, Saturn has 62 satellites, Uranus has 27 satellites, and Neptune has 14 satellites.
The planet P locates in the 3rd orbit of our solar system. Hence it is earth. In the above discussion, we find that P has fewer satellites.

Ques. 07 "There are two types of satellites" — Teacher said when he explained about the satellites in his science class. One is artificial satellites — "Plays many important role for the mankind". Second one is natural satellites.

a. What is Galaxy? 1
b. Explain the Big Bang Theory. 2
c. How can the second satellite revolves around the earth ? Explain it. 3
d. Analyze the teacher's comment for the first satellite. 4

• *Sylhet Board 2018*

Answer to Question No. 07 :

a In the space, there are billions of stars. They are far apart from one another. They fall into numerous groups each of which is called a galaxy.

b Taking into consideration the available evidence on the age of the universe, the helium abundance and the temperature of the background radiation, Astonomers think that the universe started with a massive explosion. This massive explosion is called Big Bang.

c First satellite is an artificial satellite. It revolves around the earth.
For the orbital motion of a satellite around the earth there must be a centripetal force working inwards. This force comes from the earth's gravitational attraction. The calculation shows that to launch a satellite into an orbit round the earth a speed of about 8 kilometer per second is needed. This speed is achieved by using a multi-stage launching system. As the first stage motor uses up its fuel, it drops off. So the second stage rocket does not carry its weights. The speed is increased stage by stage because at lower atmosphere the air friction is larger for the higher density of air. This can create enormous heat and burn the rocket.

d According to stem, the first satellite is artificial satellite. It plays many important role for mankind in various ways. The artificial satellites are used for different purposes. They are named according to their uses.
Communication satellites : Telephonic message in the form of radio wave is sent through a dish antenna to an artificial satellite. The satellite transmit the signal to the antenna of the receiving country from where it reaches the person concern.
In the same way different cultural functions and games are watched in various countries by means of artificial satellites.
Earth observation Satellites : These satellites can give us clean pictures of earth's surface. They can take photographs from high altitude and can observe the position of the ships in the sea and possible leakage of oil from ships causing pollution. They can observe the fields of crops over vast areas and find out where crops are growing well and where there is infestation of insects. Earth observation satellites are also used for discovering minerals and locate mountains and forests with great accuracy.
Weather satellites : These satellites transmits images of weather and earth's environment. So, weather forecast is possible about rainfall, tsunami and cyclone is possible in advance.
Military satellites : These are used to locate the enemy positions and to find out whether the enemies take the opportunity to attack.
Navigation satellites : These are used to locate the exact positions water of water vehicles.

Ques. 08 নি bন:

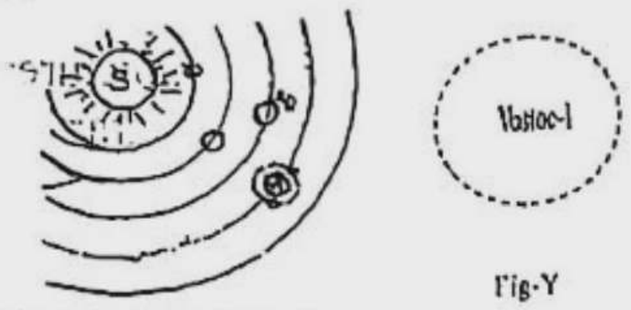


Fig-Y

a. What is outer space? 1
b. How can we watch the games held in different countries of the world on the television? 2
c. Describe the method of revolving of the figure-'Y' in the orbit. 3
d. Among the members of 'S' family the number of satellites of 'P' is fewer. Analyse. 4

● *Barishal Board 2018*

Answer to Question No. 08 :

a The outer space is the vast extension of space beyond the atmosphere.

b We can watch the games held in different countries of the world on television through artificial satellite. For this, a signal in the form of a radio wave is sent through a dish antenna to an artificial satellite. The satellite transmits the signal to the receiving country. It then reaches the screens of TV sets either having dish antennas or connected to a dish line. Here the satellite works as a relay station.

c Fig-Y of the stem is Vostoc-1 which is an artificial satellite. The object that are sent by men to the outer space to revolve round the earth is called artificial satellite. The method of revolving of artificial satellite in the orbit is described below–
For the orbital motion of a satellite around the earth there must be a centripetal force working inwards. This force comes from the earth's gravitational attraction. The calculation shows that to launch a satellite into an orbit round the earth a speed of about 8 kilometer per second is needed. This speed is achieved by using a multi-stage launching system. As the first stage motor uses up its fuel, it drops off. So the second stage rocket does not experience its weight. The speed is increased stage by stage because at lower atmosphere air friction is higher for higher density of air. This can create enormous heat and burn the rocket.

d In the stem, 'S' is solar system and 'P' is a planet which is earth.
The galaxy to which we belong is the Milky-Way. In the Milky-Way the sun is located along with its family members. They together form the solar system where 8 planets are revolving round the sun. These planets are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

Some of the planets have more than one satellite. The objects which revolve around the planets are called satellites. For example, the moon is a satellite of the earth.
Scientists think that the sun, the planets and their satellites are formed from a huge cloud of gas and dust. A star near the cloud exploded, making the cloud spin. As the cloud spun around and stuck together to form lumps. In time the stars crashed into each other and that formed satellites. The cloud in the same way gathered into lump around the planets to form their satellites. The planets and satellites do not radiate light or heat because they are not big enough to start nuclear reaction as happened in stars. The Earth has 1 satellite, Mars has 2 satellites, Jupiter has 67 satellites, Saturn has 62 satellites, Uranus has 27 satellites, and Neptune has 14 satellites.
It is now evident among the members of 'S' family the number of satellites of 'P' is fewer.

Ques. 09

Name of Satellite	Usage
A	Transfers television programs and telephone news from one end to another end of the earth.
B	Gives the clear picture on the surface of the earth.

a. How many satellites are there of the planet Venus? 1
b. What do you mean by solar system? 2
c. Explain the effectiveness of the satellite A. 3
d. How much effective the satellite-B is in preventing environment pollution and crop production? Give your opinion with logic. 4

● *Jashore Board 2017*

Answer to Question No. 09 :

a The planet Venus has no satellite.

b The galaxy our planet belongs to is called the Milky-way where the sun is located along with its members, i. e. the planets. This family consisting of the sun and eight planets is called the solar system. The planets revolve around the sun. They are Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus and Neptune.

c According to the stem, satellite–A is a communication satellite. We often communicate with the outside world over telephone. When we use telephone, the signal is sent a radio wave through a dish antenna to an artificial satellite. The satellite transmits the radio signal to the antenna of the receiving country. From there it reaches the telephone of the person with whom we are talking. We also watch different cultural functions and

games like World Cup or Olympic Games held in various countries by means of artificial satellites. It works in the same way where the signal is first sent to a satellite from a dish antenna which in its turn send it to our dish antenna. Finally the information is displayed on television. Here the satellite works as a relay station.

d A smaller body orbiting a larger one, usually a planet, is called a satellite. An artificial satellite is a space vehicle designed to orbit a large body, usually the earth. Artificial satellites are used for different purposes. They are named according to their uses. The satellite–B mentioned in the stem is Earth observation satellite.

These satellites can give us clean pictures of earth's surface. Because it can take photographs from high altitude and can observe the position of the ships in the sea and possible leakage of oil from ships causing pollution. They can observe the fields of crops over vast areas and find out where crops are growing well and where there is invasion of insects. Earth observation satellites are also used for discovering minerals and locate mountains and forests with great accuracy.

Knowledge & Comprehension-based Q/A — Designed as per topic

Preparatory Knowledge-based Q/A

Question 1. How long distance above the ground does the outer space exist?
Ans. The outer space exists about a long distance of 160 Km above the ground.

Question 2. What is the measure of one light year?
Ans. The measure of one light year is 9 trillion km.

Question 3. How is the distance between the sun and its nearest star named Alpha centerio?
Ans. The distance between the sun and its nearest star named Alpha Centerio is over 4 light years.

Question 4. What is called the galaxy to which we belong?
Ans. The galaxy to which we belong is known as the Milky-way.

Question 5. How many planets are there in the solar system?
Ans. There are 8 planets in the solar system.

Question 6. How old is the universe according to the scientists?
Ans. According to the scientists, the universe is of about 13.75 billion years old.

Question 7. How many satellites are there in the Solar System?
Ans. There are 41 satellites in the Solar System.

Question 8. Who first introduced war rocket?
Ans. The Chinese at first introduced war rocket in the eleventh century.

Question 9. Who initiated the first journey into the outer space?
Ans. The Soviet Union initiated the first journey into the outer space.

Question 10. What was taken as a mission in 1975 for international communication?
Ans. Appolo Souz was taken as a mission in 1975 for international communication.

Question 11. What type of force is essential for the orbital motion of a satellite around the earth?
Ans. Centripetal force is essential for the orbital motion of a satellite around the earth.

Question 12. What speed is needed to launch a satellite into an orbit round the earth?
Ans. A speed of about 8 kilometer per second is needed to launch a satellite into an orbit round the earth.

Preparatory Comprehension-based Q/A

Question 1. How can you define the Universe?
Ans. There are thousands of galaxies consisting of billions of stars, planets, satellites and space between then as well as nebulae and other celestial bodies in the space. It is thought that there are many celestial bodies millions of light years (1 light year is the distance that light travel in a year) away, the light from which has not yet reached us in the millions of years after the creation of the earth. The world composed of all those celestial bodies and the space between tham is called the Universe.

Question 2. What is the Milky-way?
Ans. Our Solar System consists of the sun at the centre and with eight of its planets and 41 satellites of its planets. A galaxy consists of millions of celestial bodies like our solar system. Out of innumerable galaxies in the space, the particular galaxy which includes our solar system is known as the Milky-way.

Question 3. What is called Big Bang Theory?
Ans. Taking into consideration the available evidence on the age of the Universe, the helium abundance and the temperature of the background radiation. Astonomers think that the Universe started with a massive explosion, that is called Big Bang Theory.

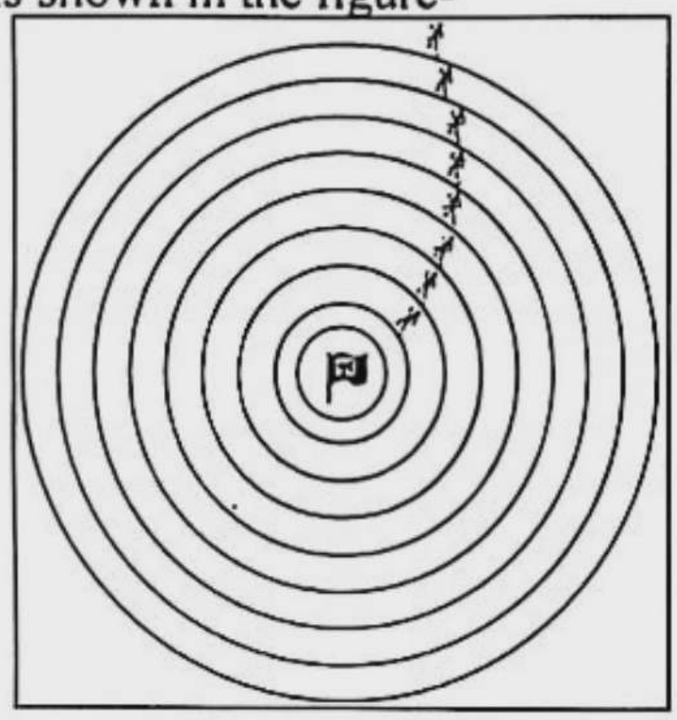
Question 4. The Universe is expanding– Explain.
Ans. When scientists look at distant galaxies they see that other galaxies are moving away from our galaxy i.e. from the Milky-way. More distant galaxies are moving away from each other. From this end in view, we can say that the Universe is expanding continuously.

Solutions to Textual Activities Along with textual reference

Solutions to Activities of Exercise

Project 01 Make a model of the solar system with the help of the teacher. ▸ Textbook Page 127

Solution : The Sun is at the centre of the solar system and the eight planets around it move in fixed orbits. A national flag placed in the centre of a circle in the school grounds can be considered as the sun. Eight students will run in the same direction in eight consecutive circular paths around it. These eight students will be in eight circular paths. This situation can be considered as a model of the solar system. This incident is shown in the figure-



Solutions to Topic Related Activity

Activity 01 What is space? Know it with the help of different books and magazines. What are the things are there in space? Write down in your notebook. Compare your findings in a group and present in the classroom with the teacher in presence. ▸ Textbook Page 126

Solution : From different books and magazines, I came to know that our homeland is surrounded by the infinite sky. This ancient and endless sky is called space.

According to astronomers, space is the region in which all the matter and energy of the universe is arranged in a floating state. There is no beginning or end of space. The space is comprised with-

1. Stars,
2. Planet,
3. Satellite,
4. Comet,
5. Galaxy,
6. Meteors,
7. Nebula,
8. Pulsar,
9. Black Dwarf and
10. Black Hole

Super Suggestions

Super Suggestions with 100% preparatory questions selected by the Master Trainer Panel

Dear learners, important multiple choice, short, creative, knowledge & comprehension-based questions of this chapter selected by Master Trainer Panel for Half-Yearly and Annual Exams are presented below. Learn the answers to the mentioned questions well to ensure 100% preparation.

Question Pattern	7★	5★
○ MCQs with Answers	Learn each MCQs in this chapter thoroughly.	
○ Short Q/A	3, 7, 10, 13, 15, 17, 20, 22	1, 4, 6, 9, 14, 16, 19
○ Creative Q/A	1, 3, 4, 7	2, 5, 8, 9
○ Knowledge-based Q/A	2, 3, 5, 8, 10	1, 4, 6, 9
○ Comprehension-based Q/A	1, 2	3

Exclusive Tips ▸▸ Master the solutions to all the activities in this chapter along with exercise and other Q/A to develop the creative thinking and assess your talent.

Assessment & Evaluation

A question bank presented in the form of a class test to assess the preparation

Class Test Time : 3 hours **Science** Full marks : 100

Class : Eight

Multiple Choice Questions (Each question carries 1 mark) 1 × 30 = 30

[N.B. : Answer all the questions. Each question carries one mark. Block fully, with a ball-point pen, the circle of the letter that stands for the correct/best answer in the "Answer Sheet" for Multiple Choice Question Type Examination.]

1. What is called to the thing shown by Raju's father?
ⓐ Planet ⓑ Star
ⓒ Artificial Satellite ⓓ Satellite

2. From how much km above the ground, the outer space begins, where atmosphere ends?
ⓐ 161 ⓑ 160 ⓒ 155 ⓓ 150

3. Which is taken as a part of outer space?
ⓐ Planet ⓑ Atmosphere
ⓒ The Milky-Way ⓓ Earth

4. Which of the following has its own light?
ⓐ Planet ⓑ Star
ⓒ Artificial satellite ⓓ Natural satellite

5. Galaxies —.
i. Proxima Centauri ii. Andromeda
iii. Milky-Way
Which one of the following is correct?
ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

6. What is the speed of light?
ⓐ 3×10^8 ms^{-1} ⓑ 3×10^9 ms^{-1}
ⓒ 0.3×10^8 ms^{-1} ⓓ 0.03×10^8 ms^{-1}

7. What is the approximate time sunlight need to reach the earth's surface?
ⓐ 500 sec ⓑ 520 sec
ⓒ 560 sec ⓓ 570 sec

8. How many satellites does the Uranus have?
ⓐ 13 ⓑ 27 ⓒ 34 ⓓ 36

9. Planets having no satellite —.
i. the Murcury
ii. the Venus
iii. the Saturn
Which one of the following is correct?
ⓐ i & ii ⓑ ii & iii ⓒ i & iii ⓓ i, ii & iii

10. What is the colour of the biggest stars?
ⓐ Red ⓑ Blue ⓒ Yellow ⓓ Indigo

11. Which planet of the solar system has the third highest number of satellites?
ⓐ Saturn ⓑ Neptune ⓒ Jupiter ⓑ Urenus

12. Which planet has 27 satellites?
ⓐ Jupiter ⓑ Saturn
ⓒ Uranus ⓓ Neptune

13. Which planet has 67 satellites?
ⓐ Jupiter ⓑ Saturn ⓒ Uranus ⓓ Neptune

14. Which planet has maximum satellites?
ⓐ Saturn ⓑ Jupiter ⓒ Uranus ⓓ Neptune

15. What is the next planet of earth in solar system?
ⓐ Uranus ⓑ jupiter ⓒ Mars ⓓ Saturn

16. How many planets do not have any satellite?
ⓐ five ⓑ four ⓒ three ⓓ two

17. How many natural satellites are there in the solar system?
ⓐ 140 ⓑ 130 ⓒ 120 ⓓ 110

Read the stem below answer the question No. 18 and 19 :
Raju's father showing Raju a bright thing tells him that this thing is moving centering the earth. There are more 7 things like the earth moving centering the sun. These things have no light and heat of their own.

18. What is called to the thing shown by Raju's father?
ⓐ Planet ⓑ Star
ⓒ Artificial Satellite ⓓ Satellite

19. Which has no light and heat of its own?
i. The sun
ii. The Uranus
iii. The Sputnik
Which one of the following is correct?
ⓐ i & ii ⓑ i & iii ⓒ ii & iii ⓓ i, ii & iii

20. How many satellites does the Saturn have?
ⓐ 13 ⓑ 27 ⓒ 34 ⓓ 43

21. How many satellites does the Neptune have?
ⓐ 2 ⓑ 14 ⓒ 27 ⓓ 62

22. Which planet has the highest number of natural satellites?
ⓐ Neptune ⓑ Mars ⓒ Jupiter ⓓ Uranus

23. What year was the first international communication satellite initiated in the space in?
ⓐ 1970 ⓑ 1975 ⓒ 1980 ⓓ 1985

24. What does the Russian word 'Sputnik' mean?
ⓐ the space ⓑ a scientist
ⓒ an aircraft ⓓ a journey mate

25. Which is the brightest planet of the solar system?
ⓐ the Uranus ⓑ the Venus
ⓒ the Neptune ⓓ the Jupiter

26. Which scientist give logic in favour of the Big Bang?
ⓐ Newton ⓑ Ritherford
ⓒ Stephen Hawking ⓓ Democritus

27. Which one of the following has it own light?
ⓐ Star ⓑ Earth ⓒ Mercury ⓓ Moon

28. What is the age of Universe?
ⓐ 1300 crore year ⓑ 1330 crore year
ⓒ 1350 Crore year ⓓ 1375 crore year

29. Which planet has the highest number of satellites?
ⓐ Mars ⓑ Earth ⓒ Uranus ⓓ Neptune

30. Which planet lies nearest to the sun?
ⓐ the Venus ⓑ the Mercury
ⓒ the Saturn ⓓ the Mars

Answer Sheet ▸ Multiple Choice Questions

1	ⓓ	2	ⓑ	3	ⓐ	4	ⓑ	5	ⓑ	6	ⓐ	7	ⓐ	8	ⓑ	9	ⓐ	10	ⓑ	11	ⓑ	12	ⓒ	13	ⓐ	14	ⓑ	15	ⓒ
16	ⓓ	17	ⓐ	18	ⓓ	19	ⓒ	20	ⓒ	21	ⓑ	22	ⓒ	23	ⓑ	24	ⓓ	25	ⓑ	26	ⓒ	27	ⓐ	28	ⓓ	29	ⓒ	30	ⓑ

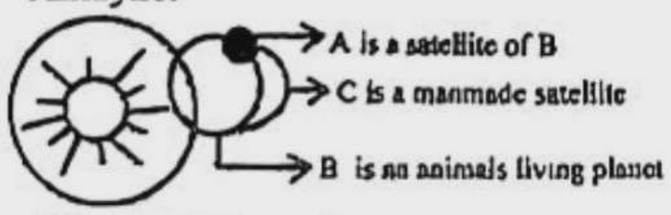
Short-Answer Question (Each question carries 2 marks)

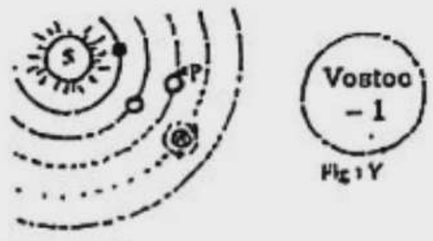
Answer any 10 of the following questions : 2 × 10 = 20

1. What are celestial objects? Explain.
2. Why is the atmosphere considered a part of the earth?-
3. Where does space begin?
4. What does star mean?
5. Write two characteristics of stars.
6. How many planets are there in the solar system and what are they?
7. Write two characteristics of planets.
8. Write two differences between planets and satellites.
9. What will happen if there is no moon?
10. How are satellites created?
11. What is the use of artificial satellites?
12. Why is the Earth observation satellite important in the field of environment?
13. Write the names of two artificial satellites.
14. Write two characteristics of artificial satellites.
15. Mention the uses of artificial satellites in the field of intelligence.

Creative Question (Each question carries 10 marks)

Answer any 5 of the following questions : 10 × 5 = 50

1. Ratul's father was watching news on CNN channel last night. Ratul's mother got angry at this because she was missing a drama serial on another channel. Ratul told his father to buy him another TV set on the ground that he was often missing his favourite programmes like horror movies, action movies, entertainment programmes, etc. on different channels.
   a. What is the distance between the earth and the moon? 1
   b. CNN is an American channel. How is it possible to watch it in Bangladesh? 2
   c. State the contributions of satellite technology. 3
   d. "In case of Bangladesh, satellite technology is at the same time a satellite aggression."– Evaluate the statement. 4
2. 'X'-Human launched satellite.
   'Y'- The satellite of earth.
   a. What is Milky-way? 1
   b. Explain the incident of Big Bang. 2
   c. Describe the spin motion of satellite 'Y'. 3
   d. What is die role of the satellite 'X' in human life? Analyze. 4
3. 

   a. What is Universe? 1
   b. How do we watch the world cup cricket game in television? 2
   c. Explain how does the figure- 'A' is revolving around 'B'? 3
   d. The importance of 'C' in modern life is immense— Analyse the statement. 4
4. **Artificial Satellite — Function**
   P → Talking over mobile
   Q → Collecting image of invasion of insects
   R → Forecasting about rain and storm
   S → Knowledge about the space
   a. What is called space? 1
   b. There is beginning of space but no end — Explain. 2
   c. How is P activated to move around the earth? — Explain. 3
   d. Among the satellites mentioned in the stem which are more important for human life? — Analyze. 4
5. 

   a. What is outer space? 1
   b. Why can we know the news of rainfall, wind and cyclone of the next days? 2
   c. Describe the method of revolving of the figure Y in the orbit. 3
   d. "Among the members of 'S' family" the number of satellites of P is fewer".– Analyse. 4
6. "There are two types of satellites" — Teacher said when he explained about the satellites in his science class. One is artificial satellites — "Plays many important role for the mankind". Second one is natural satellites.
   a. What is Galaxy? 1
   b. Explain the Big Bang Theory. 2
   c. How can the second satellite revolves around the earth ? Explain it. 3
   d. Analyze the teacher's comment for the first satellite. 4
7.

Artificial Satellites	Work
A	Observe the possible leakage of oil from ships causing pollution.
B	To see the ICC World Cup-2019 which is held in England.

   a. What is called by outer space? 1
   b. Why the Earth enlighted? 2
   c. Explain the working activity of 'A'. 3
   d. Analyze there is a similarity between the natural satellite of the planet which is situated in the third orbit of the solar system and B, but their activity is different. 4
8.

Name of Satellite	Usage
A	Transfers television programs and telephone news from one end to another end of the earth.
B	Gives the clear picture on the surface of the earth.

   a. How many satellites are there of the planet Venus? 1
   b. What do you mean by solar system? 2
   c. Explain the effectiveness of the satellite A. 3
   d. How much effective the satellite-B is in preventing environment pollution and crop production? Give your opinion with logic. 4

Science

☑ Answering Reference ▸ Short-Answer Questions

1 ▸ See this Chapter, Ques. 01 | 5 ▸ See this Chapter, Ques. 08 | 9 ▸ See this Chapter, Ques. 17 | 13 ▸ See this Chapter, Ques. 19
2 ▸ See this Chapter, Ques. 02 | 6 ▸ See this Chapter, Ques. 11 | 10 ▸ See this Chapter, Ques. 18 | 14 ▸ See this Chapter, Ques. 20
3 ▸ See this Chapter, Ques. 03 | 7 ▸ See this Chapter, Ques. 13 | 11 ▸ See this Chapter, Ques. 21 | 15 ▸ See this Chapter, Ques. 23
4 ▸ See this Chapter, Ques. 07 | 8 ▸ See this Chapter, Ques. 14 | 12 ▸ See this Chapter, Ques. 22

☑ Answering Reference ▸ Creative Questions

1 ▸ See this Chapter, Ques. 01 | 3 ▸ See this Chapter, Ques. 04 | 5 ▸ See this Chapter, Ques. 06 | 7 ▸ See this Chapter, Ques. 02
2 ▸ See this Chapter, Ques. 03 | 4 ▸ See this Chapter, Ques. 05 | 6 ▸ See this Chapter, Ques. 07 | 8 ▸ See this Chapter, Ques. 09