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3rd
Edition

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Physical Geography

Universe/Sun/Planets/Earth

1. The colour of the star is an indication of its
- Distance from the earth
 - Distance from the sun
 - Temperature
 - Luminosity

Ans. (c) The colour of the star is an indication of its temperature. The glowing is caused by something called Black-Body radiation, which has to do with the heat energy trying to radiate away in more and more energetic wavelengths. Red stars are relatively cool at only a few thousand degrees Celsius, white stars are hot at about ten thousand degrees, and blue stars are the hottest.

2. The planet nearest to the sun is
- Mercury
 - Earth
 - Venus
 - Pluto

Ans. (a) The planet nearest to the sun is mercury. Mercury is the smallest and closest to the Sun of the eight planets in the Solar System, with an orbital period of about 88 Earth days.

3. The group of stars arranged in a definite pattern is called
- Milky Way
 - Constellation
 - Andromeda
 - Solar system

Ans. (b) The group of stars arranged in a definite pattern is called constellation. In modern astronomy, a constellation is an internationally defined area of the celestial sphere. These areas are grouped around asterisms, which are patterns formed by prominent stars within apparent proximity to one another on Earth's night sky.

4. The Asteroid belt is found between which of the following?
- Earth and Mars
 - Jupiter and Saturn
 - Mars and Jupiter
 - Saturn and Uranus

Ans. (c) The Asteroid belt is found between Mars and Jupiter. The large majority of known asteroids orbit in the asteroid belt between the orbits of Mars and Jupiter, or are co-orbital with Jupiter.

5. Which one of the following is the largest satellite in solar system?
- Ganymede
 - Titan
 - Europa
 - Triton

Ans. (a) Ganymede is the largest satellite in solar system. Ganymede is a satellite of Jupiter and the largest moon in the Solar System. It is the seventh moon and third Galilean satellite outward from Jupiter. Completing an orbit in roughly seven days, Ganymede participates in a 1:2:4 orbital resonance with the moons Europa and Io, respectively. It has a diameter of 5,268 km (3,273 mi), 8% larger than that of the planet Mercury, but has only 45% of the latter's mass.

6. Which planet takes the longest time to go around the sun?
- Earth
 - Jupiter
 - Uranus
 - Neptune

Ans. (d) Neptune takes the longest time to go around the sun. Neptune orbits the Sun at an average distance of 4.5 billion km. Like all the planets in the Solar System, Neptune follows an elliptical path around the Sun, varying its distance to the Sun at different points along its orbit.

7. The planet which is called twin sister of the Earth is
- Mercury
 - Venus
 - Mars
 - Uranus

Ans. (b) The planet which is called twin sister of earth is Venus. Venus is known as the Earth's twin because of its similar size, chemical composition and density. However, due to its toxic atmosphere, Venus is not habitable.

8. The distance of Moon from the Earth is
- 384 thousand kms.
 - 300 thousand kms.
 - 350 thousand kms.
 - 446 thousand kms.

Ans. (a) The distance of moon from the Earth is 384 thousands kms. The Moon is the only natural satellite of the Earth and the fifth largest moon in the Solar System. It is the largest natural satellite of a planet in the Solar System relative to the size of its primary, having 27% the diameter and 60% the density of Earth, resulting in 1/81 its mass.

9. Which planet was named after the Roman God Zeus?
- Earth
 - Mars
 - Venus
 - Jupiter

Ans. (d) Jupiter was named on the Roman God Zeus. Zeus is the "Father of Gods and men" who rules the Olympians of Mount Olympus as a father rules the family according to the ancient Greek religion. He is the God of sky and thunder in Greek mythology. Zeus is etymologically cognate with and, under Hellenic influence, became particularly closely identified with Roman Jupiter.

10. Which of the following planets is smaller in size than the Earth?
- Venus
 - Uranus
 - Saturn
 - Neptune

Ans. (a) Venus is smaller in size than the Earth. Diameter of earth is 12,742 km while that of Venus is 12,100 km

11. The largest planet in our solar system is
- Earth
 - Uranus
 - Jupiter
 - Saturn

Ans. (c) The largest planet in our solar system is Jupiter. Jupiter is the fifth planet from the Sun and the largest planet in the Solar System. It is a gas giant with mass one-thousandth of that of the Sun but is two and a half times the mass of all the other planets in the Solar System combined.

12. Which of the following planets has largest number of satellites or moons?
- Jupiter
 - Neptune
 - Earth
 - Saturn

Ans. (a) Jupiter has largest number of satellites or moons. The planet Jupiter has 67 confirmed moons. This gives it the largest retinue of moons with "reasonably secure" orbits of any planet in the Solar System.

13. Which of the following planets is called "Blue planet"?
- Venus
 - Earth
 - Uranus
 - Mercury

Ans. (b) Earth is called the 'Blue Planet' due to the abundant water on its surface. This is because liquid water covers most of the surface of the planet. The Earth has the right mass, chemical composition, and location can support liquid water.

14. The approximate diameter of Earth is
 (a) 4200 km (b) 6400 km
 (c) 3400 km (d) 12800 km

Ans. (d) The approximate diameter of Earth is 12800 km. The rotation of the planet has slightly flattened it out, so it has a larger diameter at the equator than at the poles. The equatorial diameter of Earth is 12,756 km, its polar diameter is 12,713 km, and its average diameter, which is referred to in common usage, is 12,742 km or 7,926 miles.

15. The Earth rotates around its axis from
 (a) North to South (b) South to North
 (c) East to West (d) West to East

Ans. (d) The Earth rotates around its axis from west to east. Earth's rotation is the rotation of the solid Earth around its own axis. The Earth rotates from the west towards the east. As viewed from the North Star or polestar Polaris, the Earth turns counter-clockwise.

16. What is the time taken by the Earth to complete one rotation on its axis?
 (a) 23 hr 52 min 4 sec (b) 23 hr 56 min 4 sec
 (c) 24 hr (d) 24 hr 12 min 6 sec

Ans. (b) The time taken by the Earth to complete one rotation on its axis is 23 hr-56 min 4 sec.

17. Which of the following is the nearest star of Earth?
 (a) Sirius (b) Sun
 (c) Rigel (d) Vega

Ans. (b) The distance from sun to Earth is called an astronomical unit (AU) one of the Nearest star sirius is more than thousands of AU distance from earth.

18. Which one of the following planets is the brightest?
 (a) Mars (b) Mercury
 (c) Venus (d) Jupiter

Ans. (c) Venus is the brightest planet. It is third brightest object in sky after the sun and moon.

19. The mean radius of the Earth is
 (a) 3200 km (b) 6400 km
 (c) 8400 km (d) 12800 km

Ans. (b) The mean radius of Earth is 6371 km or approximately a 6400 km

20. Which one of the following planets rotates clockwise?
 (a) Earth (b) Mars
 (c) Venus (d) Mercury

Ans. (c) The planet Venus rotates clock wise. On Venus, the rotation is backwards, or clockwise, which is called retrograde. Standing on the surface of Venus, one would be able to see the sun rising from the west.

21. The nuclear fuel in the Sun is
 (a) Helium (b) Hydrogen
 (c) Oxygen (d) Uranium

Ans. (b) The nuclear fuel in the sun is Hydrogen. Actually the sun isn't "burning," but instead its heat and light comes from its core where the element hydrogen is continuously being converted into the element helium. This known as nuclear fusion and is basically the same thing a hydrogen bomb does.

22. The outermost layer of the sun is called
 (a) Chromosphere (b) Photosphere
 (c) Lithosphere (d) Corona

Ans. (d) The outermost layer of the sun is called corona. A corona is a type of plasma that surrounds the Sun and other celestial bodies. The Sun's corona extends millions of kilometers into space and is most easily seen during a total solar eclipse, but it is also observable with a coronagraph.

23. The surface temperature of sun is nearly
 (a) 2000 K (b) 4000 K
 (c) 6000 K (d) 8000 K

Ans. (c) The surface temperature of Sun is 5778 K or approximately 6000 K.

24. What is meant by the term "Midnight Sun"?
 (a) Twilight
 (b) Rising sun
 (c) Very bright moon
 (d) Sun shining in the polar circle for long time

Ans. (d) Midnight Sun occurs in Polar region in Summer months where sun remains visible at local midnight.

25. Which of the following planets is known as "Red Planet"?
 (a) Earth (b) Mars
 (c) Jupiter (d) Saturn

Ans. (b) Mars is known as Red planet. Mars is the fourth planet from the Sun and the second smallest planet in the Solar System. Named after the Roman God of war, it is often described as the "Red Planet" because the iron oxide prevalent on its surface gives it a reddish appearance. Mars is a terrestrial planet with a thin atmosphere, having surface features reminiscent both of the impact craters of the Moon and the volcanoes, valleys, deserts, and polar ice caps of Earth.

26. The planet whose period of rotation is longer than the period of revolution around the sun is
 (a) Mercury (b) Mars
 (c) Venus (d) Neptune

Ans. (c) Venus is the planet whose period of rotation is longer than the period of revolution around the sun. The period of rotation for Venus is 243 days. In other words, Venus takes 243 days to turn once on its axis so that the stars are in the same position in the sky.

27. The last stage in the life cycle of a star is
 (a) Black Hole (b) Supernova
 (c) Red Giant (d) White Dwarf

Ans. (d) The last stage in the life cycle of a star is white dwarf. Small stars, like the Sun, will undergo a relatively peaceful and beautiful death that sees them pass through a planetary nebula phase to become a white dwarf.

28. Time taken by Sun's light to reach Earth is
 (a) 8 min 20 sec (b) 9 min
 (c) 9 min 18 sec (d) 6 min 18 sec

Ans. (a) On an average Sunlight reaches on Earth in 8 min. 20 sec.

29. Time taken by Moon's light to reach Earth is
 (a) 58 sec (b) 1.26 sec
 (c) 1.58 sec (d) 2.32 sec

Ans. (b) Moonlight reaches on Earth around 1.3 sec.

30. Space between Earth and Moon is known as
 (a) Cislunar (b) Fulalunar
 (c) Nebula (d) None of these

Ans. (a) Space between Earth and Moon is known as Cislunar. Pertaining to the space between the earth and the orbit of the moon.

31. Our solar system is located in which Galaxy?
 (a) Proxima Centauri (b) Alpha Centauri
 (c) Milky Way (d) Andromeda

Ans. (c) Our solar system is located in Milky Way Galaxy. The Milky Way is the galaxy that contains our Solar System. Its name "milky" is derived from its appearance as a dim glowing band arching across the night sky in which the naked eye cannot distinguish individual stars.

32. Which of the following stars is also known as Pulsar?
 (a) Red Giant (b) White Dwarf
 (c) Neutron Star (d) Massive Star

Ans. (c) Neutron star is also known as Pulsar. A neutron star is a type of stellar remnant that can result from the gravitational collapse of a massive star.

33. Which of the following stars is known as Fossil star?
 (a) Protostar (b) Dog Star
 (c) Red Giant (d) White Dwarf

Ans. (d) White Dwarf is known as Fossil star. They are supported by electron degeneracy pressure. It amplifies the contrast with red giants. They are both very hot and very small. They are the opposite of black holes. They are the end-products of small, low-mass stars.

34. The energy of sun is produced by
 (a) Nuclear fission (b) Ionisation
 (c) Nuclear fusion (d) Oxidation

Ans. (c) Sun generates its energy by nuclear fusion of hydrogen nuclei into helium.

35. Which of the following does not belong to solar system?
 (a) Asteroids (b) Comets
 (c) Planets (d) Nebulae

Ans. (d) Nebulae is an interstellar cloud of dust in outer space.

36. Which one of the following planets is nearest to the earth?
 (a) Mercury (b) Venus
 (c) Mars (d) Uranus

Ans. (b) Venus is nearest planet to Earth. Although distance is not fixed and it may vary from 38 million to 261 million Km depending upon orbital motion.

37. Cycle of sunspots is
 (a) 9 years (b) 10 years
 (c) 11 years (d) 12 years

Ans. (c) The number of sunspots observed on the surface of the sun varies from year to year in a cyclical way. The length of the cycle is around 11 years on average.

38. The group of small pieces of rocks revolving round the sun between the orbits of Mars and Jupiter are called
 (a) Meteors (b) Comets
 (c) Meteorites (d) Asteroids

Ans. (d) The group of small pieces of rocks revolving round the sun between the orbits of Mars and Jupiter are called asteroids.

39. Which one of the following conditions is most relevant for the presence of life on Mars?
 (a) Atmospheric composition
 (b) Thermal conditions
 (c) Occurrence of ice cap and frozen water
 (d) Occurrence of ozone

Ans. (c) Presence of ice cap and frozen water on Mars is one of the most significant reasons for presence of life forms.

40. Among the following which planet takes maximum time for one revolution around the sun?
 (a) Earth (b) Jupiter
 (c) Mars (d) Venus

Ans. (b) Jupiter takes maximum time for one revolution around the sun. Jupiter revolves or orbits around the Sun once every 11.86 Earth years, or once every 4,330.6 Earth days. Jupiter travels at an average speed of 29,236 miles.

41. Which planet is called "Evening star"?
 (a) Mars (b) Jupiter
 (c) Venus (d) Saturn

Ans. (c) Venus is called the Evening star. Because it trails the Sun in the sky and brightens into view immediately after the Sun sets and when the sky is dark enough. When Venus is at its brightest, it appears visible merely minutes after the Sun has set.

42. The Earth distance becomes minimum from the sun?
 (a) 3rd January (b) 4th July
 (c) 22nd March (d) 21st September

Ans. (a) The Earth shows minimum distance from the Sun on 3rd January.

43. Which planet is surrounded by ring?
 (a) Saturn (b) Mars
 (c) Venus (d) Earth

Ans. (a) Saturn is surrounded by ring. Saturn has a ring around it because it is believed to be very big and has lots of moons, meaning it has a strong pull of gravity. Another major reason is that the asteroids fling into its orbit and the rings are not solid.

44. Lunar eclipse occurs
 (a) When moon lies between earth and sun
 (b) When earth lies between sun and moon
 (c) When sun lies between earth and moon
 (d) None of these

Ans. (b) In Lunar eclipse Earth comes between Sun and Moon.

45. By how much degree the earth is inclined on its own axis
 (a) 23 1/2 (b) 66 1/2
 (c) 24 1/2 (d) 69 1/2

Ans. (a) Earth is inclined by 23 1/2 degree on its axis.

46. The planet Pluto has been abandoned from the group of conventional planet and kept in the group of dwarf planet by a summit held in
 (a) Paris (b) London
 (c) Geneva (d) Prague

Ans. (d) The planet Pluto has been declared as a dwarf planet in the summit held in Prague. In August 2006 the International Astronomical Union (IAU) downgraded the status of Pluto to that of "dwarf planet." This means that from now on only the rocky worlds of the inner Solar System and the gas giants of the outer system will be designated as planets.

47. Which of the following elements occurs the most abundantly in our universe?
 (a) Hydrogen (b) Oxygen
 (c) Nitrogen (d) Helium

Ans. (a)

48. Two planets which have no satellites
 (a) Earth and Uranus (b) Mercury and Venus
 (c) Mercury and Mars (d) Venus and Mars

Ans. (b)

49. The Astronaut looks the sky in the space
 (a) Blue (b) Black
 (c) Red (d) White

Ans. (b) The sky looks black from the space. In space, sunlight or any kind of star light does not have anything from which to bounce off.

50. The black part of the moon is always calm and dark which is called
 (a) Sea of tranquility (b) Ocean of storms
 (c) Area of storms (d) none of these

Ans. (a) The black part of the moon is called sea of tranquility. Sea of tranquility is not an actual sea but rather the point at which Apollo 11 first landed on when it reached the moon. It is a lunar mare which mainly consists of basalt rock and is located on the Tranquillitatis basin which is on the Moon. The mare has a tint which is slightly blue in colour and stands out from the rest of the moon.

51. What is the most accurate description of the shape of the earth ?
 (a) A circle (b) A sphere
 (c) A geoid (d) An oblate sphere

Ans. (d)

52. When the earth is at its maximum distance from the sun it is said to be in
 (a) aphelion (b) perihelion
 (c) apogee (d) perigee

Ans. (a)

53. What is the primary cause of the day and night ?
 (a) Earth's annual motion
 (b) Earth's rotation on its axis
 (c) Inclination of the earth's axis and its rotation
 (d) Inclination of the earth's axis and its revolution

Ans. (b)

54. What causes the change of seasons ?
 (a) Earth's rotation and revolution
 (b) Earth's revolution
 (c) Earth's revolution and inclination of its axis
 (d) Earth's rotation and inclination of its axis

Ans. (c) The revolution of the earth around the sun alone is not enough for change of seasons. Had the axis of the earth been vertical, the sun would have been vertical at the same latitude throughout the year. Therefore the revolution of the earth and its inclination, both are necessary for the change of seasons.

55. On which planet would one witness sunrise in the west ?
 (a) Jupiter (b) Venus
 (c) Saturn (d) Mercury

Ans. (b) The direction of the sunrise depends upon the direction of the rotation of the earth on its axis. Any planet rotation on its axis from west to east will experience sunrise in the east and vice versa. Venus rotates on its axis from east to west and thus experiences sunrise in the west.

56. The latitude is the angular distance of a point on the earth's surface with respect to the
 (a) Equator (b) Prime meridian
 (c) Pole star (d) Tropic of Cancer

Ans. (a) Latitude is distance North or south of the equator. It may also be defined as an angle which ranges from 0° at the equator to 90° at the poles.

57. The longitude of a place is its
 (a) angular distance east or west of the prime meridian
 (b) angular distance north or south of the equator
 (c) angular distance east or west of International Date Line
 (d) angular distance with respect to the pole star

Ans. (a) Longitude is measured in degrees East or West of the Prime Meridian.

58. On which date is the earth in perihelion ?
 (a) June 21 (b) Dec 22
 (c) January 3 (d) July 4

Ans. (c) The Earth is closest to the Sun or at the perihelion on January 3, when it is winter in the Northern Hemisphere.

59. The earth is in aphelion on
 (a) June 21 (b) Dec. 22
 (c) Sept. 23 (d) July 4

Ans. (d) The Earth is farthest from the sun at the Aphelion on July 4, when it is summer in the Northern Hemisphere.

60. The sun is vertical over the Tropic of Cancer on
 (a) March 21 (b) June 21
 (c) Sept. 23 (d) Dec. 22

Ans. (b) Sun is vertical over the tropic of cancer on June 21 or Summer Solstice.

61. What is most important about the Arctic and the Antarctic circles ?
 (a) Within these circle only can the days and nights be longer than 24 hours
 (b) The days and nights are never more than 24 hours long here
 (c) Both areas frozen continents
 (d) Both regions are uninhabited

Ans. (a)

62. What is true about the equinox ?
 (a) Vertical sun over the Tropic of Cancer
 (b) Vertical sun over the Tropic of Capricorn
 (c) Vertical sun over the equator
 (d) Continuous day in the polar regions

Ans. (c)

63. How much is the mass of the moon when compared with that of the earth ?
 (a) 1/49 (b) 1/81
 (c) 1/51 (d) 1/8

Ans. (b)

64. How much of the total surface area of the moon is never visible from the earth
 (a) 41 per cent (b) 47 per cent
 (c) 53 per cent (d) 59 per cent

Ans. (a)

65. The average distance between the moon and the earth's
 (a) 384,000 km (b) 267,000 km
 (c) 540,000 km (d) 576,000 km

Ans. (a)

66. The average distance between the sun and earth is
 (a) 145 million km (b) 150 million km
 (c) 155 million km (d) 160 million km

Ans. (b)

67. Greenwich mean time is _____ IST.
 (a) 5.5 hours ahead (b) 12 hours ahead
 (c) 4.5 hours behind (d) 5.5 hours behind

Ans. (d)

68. What is the unit of measurement of distance between celestial bodies ?
 (a) Nautical mile (b) Statute mile
 (c) Light year (d) Kilometre

Ans. (c)

69. On the surface of the moon
 (a) the mass of an object is more but it weighs lesser
 (b) the mass and weight both remain unchanged
 (c) the mass is the same but the weight is lesser
 (d) the mass is more but the weight is lesser

Ans. (c)

70. The shortest route between two places is along the
 (a) latitudes (b) longitudes
 (c) rivers (d) direction of winds

Ans. (b) The shortest distance between two places on the earth surface is along the Great Circles. The property of a great circle is that a plane passed along it passes through the centre of the earth and divides it into two equal parts or hemispheres. Among the latitudes only the equator is a great circle while among longitudes all of them are great circles.

71. Consider the following statements regarding asteroids:
 1. Asteroids are rocky debris of varying sizes orbiting the Sun.
 2. Most of the asteroids are small but some have diameter as large as 1000 km.
 3. The orbit of asteroids lies between orbits of Jupiter and Saturn.

Which of the statements given above are correct?

- (a) 1 and 2 only (b) 2 and 3 only
 (c) 1 and 3 only (d) 1, 2 and 3

Ans. (a) Asteroids are rocky debris of varying sizes orbiting the Sun. They are generally small but some has the diameter of 1000 km. Asteroids are minor planets whose orbits lie between Jupiter and Mars. These are said to be the fragments of a larger planet disrupted long ago. Their number is estimated to be 30,000 pieces of rocky debris out of which more than half are known.

72. Which one of the following statements is correct with reference to our solar system?
 (a) The earth is the densest of all the planets in our solar system.
 (b) The predominant element in the composition of Earth is silicon.
 (c) The Sun contains 75 percent of the mass of the solar system.
 (d) The diameter of the sun is 190 times that of the Earth.

Ans. (a) The Earth is the densest planet in the solar system. The density of Earth is 5.513g/cm³. This is an average of all the material on the planet.

73. Match List-I with List-II and select the correct answer using the codes given below the list:

List-I (Special characteristic)	List-II (Name of Planet)
A. Smallest planet of the solar system	1. Mercury
B. Largest planet of the solar system	2. Venus
C. Planet second from the Sun in the Solar system	3. Jupiter
D. Planet nearest to the Sun	4. Saturn

Codes:

	A	B	C	D
(a)	2	3	4	1
(b)	3	4	1	2
(c)	1	1	2	3
(d)	1	3	2	1

Ans. (d) Smallest planet of the solar system is Mercury while the largest is Jupiter. Planet second from the Sun in the solar system is Venus; planet nearest to the Sun is Mercury.

74. Diamond Ring is a phenomenon observed
 (a) at the start of a total solar eclipse.
 (b) at the end of a total solar eclipse.
 (c) only along the peripheral regions of the totality trail.
 (d) only in the central regions of the totality trail.

Ans. (c) Diamond Ring is the phenomenon which occurs along the peripheral regions of the totality trail. As the last bits of sunlight pass through the valleys on the moon's limb, and the faint corona around the sun is just becoming visible, it looks like a ring with glittering diamonds on it.

75. The term 'syzygy' is referred to when
 (a) The Earth is at perihelion and the Moon at perigee.
 (b) The Earth is at aphelion and the Moon at apogee.
 (c) The Moon and the Sun are at right angles with reference to the Earth.
 (d) The Moon, Sun and Earth lie along a straight line.

Ans. (d) The term 'syzygy' is referred to when the moon, sun and earth lie along a straight line. As seen from the Earth, a solar eclipse is a type of eclipse that occurs when the Moon passes between the Sun and Earth, and the Moon fully or partially blocks ("occults") the Sun. This can happen only at new moon, when the Sun and the Moon are in conjunction as seen from Earth in an alignment referred to as syzygy. In a total eclipse, the disk of the Sun is fully obscured by the Moon. In partial and annular eclipses only part of the Sun is obscured.

76. Consider the following two statements, one labelled as the Assertion (A) and the other as Reason (R). Examine these two statements carefully and select the correct answer by using the codes given below:

Assertion (A): To orbit around Sun, the planet Mars takes lesser time than time taken by the Earth.

Reason (R): The diameter of the planet Mars is less than that of the Earth.

Codes:

- (a) Both A and R are true and R is the correct explanation of A.
 (b) Both A and R are true, but R is not the correct explanation of A.
 (c) A is true, but R is false.
 (d) A is false, but R is true.

Ans. (d) The diameter of the planet Mars is less than that of the Earth. Mars has approximately half the diameter of Earth. It is less dense than Earth, having about 15% of Earth's volume and 11% of the mass. Its diameter is 6,779 Kms. It takes more time than Earth to orbit around the sun.

77. The twinkling of a star is due to
- the variation in the intensity of light emitted by it with time.
 - the variation in the composition of the star with time.
 - the transit of other celestial objects across the line of sight.
 - the atmospheric refraction of starlight.

Ans. (d) Twinkling of stars is due to the atmospheric refraction of stars. Stars twinkle because of turbulence in the atmosphere of the Earth. As the atmosphere churns, the light from the star is refracted in different directions. This causes the star's image to change slightly in brightness and position, hence "twinkle." This is one of the reasons the Hubble telescope is so successful: in space, there is no atmosphere to make the stars twinkle, allowing a much better image to be obtained.

78. Which of the following phenomenon is/are the effect of the rotation of the earth?
- Apparent movement of the Sun, the Moon and the Stars.
 - Flatness of the poles and bulge at the equator.
 - Occurrence of sunrise, noon and sunset.
 - Magnetic field of the earth.
- Select the correct answer by using the codes given below:
- 1 and 2 only
 - 1 and 3 only
 - 2 and 3 only
 - 1, 2, 3 and 4

Ans. (d) All the given phenomena are the effect of the rotation of the earth. The Earth rotates from the west towards the east. As viewed from the North Star or polestar Polaris, the Earth turns counter-clockwise.

79. What is meant by the eclipse of Moon?
- It occurs when the Earth comes between the Sun and the Moon and the centers of all three are on the same straight line.
 - It is path along which the moon revolves.
 - For any place, it is the average angle made by a line drawn from the moon to place and horizontal at midnight.
 - When the Moon comes between the Sun and the Earth, it causes the shadows of the Moon to fall on Earth.

Ans. (a) Eclipse of moon occurs when the Earth comes between the Sun and Moon it causes the shadow of the Earth to fall on Moon. A lunar eclipse can only happen during a full moon.

80. Consider the following statements:
- The albedo of an object determines its visual brightness when viewed with reflected light.
 - The albedo of Mercury is much greater than the albedo of the Earth.
- Which of the statement(s) given above is/are correct?
- 1 only
 - 2 only
 - Both 1 and 2
 - Neither 1 nor 2

Ans. (a) The albedo of an object determines its visual brightness when viewed with reflected light. Albedo is the fraction of solar energy (shortwave radiation) reflected from the Earth back into space. It is a measure of the reflectivity of the earth's surface.

81. The inexhaustible source of energy of the stars is due to
- decay of radioactive elements.
 - conversion of Hydrogen to Helium.
 - conversion of Helium to Hydrogen.
 - excess of oxygen that helps burning and release of energy.

Ans. (b) The inexhaustible source of energy of the stars is due to conversion of Hydrogen to Helium. In the interior of a star, the particles move rapidly in every direction because of the high temperatures present. Every so often a proton moves close enough to a nucleus to be captured, and a nuclear reaction takes place. Only protons of extremely high energy (many times the average energy in a star such as the Sun) are capable of producing nuclear events of this kind. A minimum temperature required for fusion is roughly 10 million K. Since the energies of protons are proportional to temperature, the rate of energy production rises steeply as temperature increases.

82. Consider the following statements
- The Earth receives the Sun's energy at the infrared end of the spectrum.
 - The Earth re-radiates the Sun's heat as ultraviolet energy.
- Which of the statement(s) given above is/are correct?
- 1 only
 - 2 only
 - Both 1 and 2
 - Neither 1 nor 2

Ans. (d) The sun radiates vast quantities of energy into space, across a wide spectrum of wavelengths. Most of the radiant energy from the sun is concentrated in the visible and near-visible parts of the spectrum. The narrow band of visible light, between 400 and 700 nm, represents 43% of the total radiant energy emitted. Wavelengths shorter than the visible account for 7 to 8% of the total, but are extremely important because of their high energy per photon. The shorter the wavelength of light, the more energy it contains.

83. Consider the following statements regarding asteroids and comets?
- Asteroids are small rocky planetoids, while comets are formed of frozen gases held together by rocky and metallic material.
 - Asteroids are found mostly between the orbits of Jupiter and Mars, while comets are found mostly between Venus and Mercury.
 - Comets show a perceptible glowing tail, while asteroids do not.
- Which of the statement(s) given above is/are correct?
- 1 only
 - 1 and 2 only
 - 1 and 3 only
 - 1, 2 and 3

Ans. (c) Asteroids are small rocky planetoids. They are small, airless rocky worlds revolving around the sun that are too small to be called planets. They are also known as planetoids or minor planets. In total, the mass of all the asteroids is less than that of Earth's moon. Comets are formed of frozen gases held together by rocky and metallic material. Comets show a perceptible glowing tail while asteroids do not.

84. The Blue Moon phenomenon occurs
- when two full moons occur in the same month.
 - when two full moons appear in the same month thrice in a calendar year.
 - when four full moons appear in two consecutive months of the same calendar year.
 - None of the above

Ans. (a) Blue moon phenomenon occurs when two full moons occurs in the same month. A blue moon is the second full moon in a calendar month. For a blue moon to occur the first of the full moons must appear at or near the beginning of the month so that the second will fall within the same month (the average span between two moons is 29.5 days).

85. Consider the following two statements, one labelled as the Assertion (A) and other as Reason (R). Examine these two statements carefully and select the correct answer by using the code given below:

Assertion (A): Comets revolve round the sun only in long elliptical orbit.

Reason (R): A comet develops a tail when it gets close to the sun.

Codes:

- (a) Both A and R are true and R is the correct explanation of A.
- (b) Both A and R are true, but R is not the correct explanation of A.
- (c) A is true, but R is false.
- (d) A is false, but R is true.

Ans. (b) Comets revolve around the sun only in long elliptical orbit. A comet develops a tail when it gets close to the Sun.

86. The eclipse of Sun occurs

- (a) when the Moon comes between the Sun and the Earth.
- (b) when the Earth comes between the Sun and Moon.
- (c) when the Sun comes between the Earth and Moon.
- (d) None of these

Ans. (a) The eclipse of Sun occurs when the Moon comes between Sun and the Earth. The Moon orbits the Earth once a month, and eclipses happen if it lines up exactly with the Earth and the Sun. Solar eclipses occur at New Moon, when the Moon is between Earth and the Sun. Lunar eclipses occur at Full Moon, when Earth is between the Sun and the Moon. Eclipses do not take place every month because the orbits of the Moon and Earth are tilted at an angle. Most of the time, the line-up is not precise enough for an eclipse.

87. Consider the following statements:

1. The Earth is nearest to the Sun on about January 3.
2. Earth is farthest from the Sun on about July 4.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans. (c) On January 3, our Earth made its closest approach to the Sun for the year-- an event astronomers call perihelion. At perihelion, the Earth is about 147.5 million km away from the Sun. The Earth is farthest from the Sun on 4th July.

88. Match List-I with List-II and select the correct answer using the codes given below the lists

List-I (Planets)	List-II (Satellites)
A. Mars	1. Tethys
B. Jupiter	2. Deimos
C. Saturn	3. Europa
D. Uranus	4. Titania

Codes:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 1 | 2 | 3 | 4 |
| (b) | 2 | 3 | 1 | 4 |
| (c) | 3 | 2 | 1 | 4 |
| (d) | 4 | 3 | 2 | 1 |

Ans. (b) Deimos is the satellite of Mars. Europa is the satellite of Jupiter. Tethys is the satellite of Saturn. Titania is the satellite of Uranus.

89. Consider the following statements:

1. The nearest large galaxy of Milky Way is the Andromeda galaxy.

2. The Sun's nearest known star is a red dwarf star called Proxima Centauri, at a distance of 4.3 light years away. Which of the above statement(s) is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans. (c) The nearest large galaxy of Milky Way is Andromeda galaxy. At a distance of about 2.5 million light years, the Andromeda galaxy (also known as NGC 224 and M31) is the nearest galaxy to the Earth apart from smaller companion galaxies such as the Magellanic Clouds. The Sun's nearest known star is a red dwarf star called Proxima Centauri, at a distance of 4.3 light years away.

90. Consider the following statements:

1. Our solar system is located in the orion arm of the Milky way galaxy, about two-third of the way out from the centre.
2. The solar system formed from an interstellar cloud of dust and gas or nebulla about 4.6 billion years ago.

Which of the above statements is/are correct?

- (a) 1 only
- (b) 2 only
- (c) Both 1 and 2
- (d) Neither 1 nor 2

Ans. (c) Our solar system is located in the orion arm of the milky way galaxy, about two-third of the way out from the centre. The sun is about 26,000 light-years from the center of the Milky Way Galaxy, which is about 80,000 to 120,000 light-years across (and less than 7,000 light-years thick). We are located on one of its spiral arms, out towards the edge. It takes the sun (and our solar system) roughly 200-250 million years to orbit once around the Milky Way. In this orbit, we (and the rest of the Solar System) are traveling at a velocity of about 155 miles/sec (250 km/sec).

91. Match List-I with List-II and select the correct answer using the codes given below the lists:

List-I (Planets)	List-II (Satellites)
A. Earth	1. Triton
B. Jupiter	2. Titan
C. Saturn	3. Ganymede
D. Neptune	4. Moon

Codes:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 1 | 2 | 3 | 4 |
| (b) | 2 | 1 | 3 | 4 |
| (c) | 4 | 3 | 2 | 1 |
| (d) | 3 | 4 | 2 | 1 |

Ans. (c) Moon is the satellite of Earth. Ganymede is the satellite of Jupiter. Triton is the satellite of Neptune. Titan is the satellite of Saturn.

92. Match List-I with List-II and select the correct answer from the codes given below the list:

List-I	List-II
A. Planet	1. Moon
B. Satellite	2. Uranus
C. Comet	3. Mariner
D. Artificial satellite	4. Halley

Codes:

- | | A | B | C | D |
|-----|---|---|---|---|
| (a) | 2 | 1 | 4 | 3 |
| (b) | 1 | 2 | 3 | 4 |
| (c) | 4 | 3 | 2 | 1 |
| (d) | 2 | 1 | 3 | 4 |

Ans. (a) Uranus is a planet. Moon is a satellite. Halley is a comet. Mariner is an artificial satellite. The Mariner program was conducted by the American space agency NASA in conjunction with Jet Propulsion Laboratory (JPL) that launched a series of robotic interplanetary probes designed to investigate Mars, Venus and Mercury from 1962 to 1973. The program included a number of firsts, including the first planetary flyby, the first pictures from another planet, the first planetary orbiter, and the first gravity assist maneuver.

93. Consider the following statements:

1. Only two planets Venus and Uranus revolve around the sun from east to west i.e., clockwise.
2. While other planets revolve around the sun from west to east i.e., anti-clockwise.

Which of the above statements is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Ans. (c) Only two planets Venus and Uranus revolve around the sun from east to west while other planets revolve around the sun from west to east.

94. Consider the following statements:

1. The Sun is the heart spot of the Solar system which is the source of energy of all organism of the earth.
2. The innermost layer of the Sun is called Corona.

Which of the above statement(s) is/are correct?

- (a) 1 only (b) 2 only
(c) Both 1 and 2 (d) Neither 1 nor 2

Ans. (a) The sun is the heart spot of the Solar system which is the source of energy of all organisms on Earth. Our sun is the center of our solar system and is the source of all energy for almost every organism on the face of the Earth. The sun provides a vast spectrum of energy. Everyone knows that the sun produces lots of heat and light. But our sun produces energy that is much more important. The vast amount of energy that our sun produces is called RADIANT ENERGY. Radiant energy is defined as invisible and invisible light; it is also energy that travels in waves. Directly or indirectly, the sun provides nearly all of the energy required by the organisms on Earth. The corona is the outermost layer of the Sun, starting at about 1300 miles (2100 km) above the solar surface (the photosphere). The temperature in the corona is 500,000 K (900,000 degrees F, 500,000 degrees C) or more, up to a few million K.

95. Scientists have determined the temperature near the Earth's centre 1,000°C hotter than was reported in an experiment run 20 years ago. The actual temperature is?

- (a) 6,000° Celsius (b) 5,000° Celsius
(c) 4,000° Celsius (d) None of these

Ans. (a) These measurements confirm geophysical models that say that the temperature difference between the solid core and the mantle above must be at least 1,500° C to explain why the earth has a magnetic field. The research team, which was led by Agnes Dewaele from the CEA, a French technological research organisation, used X-rays from the European Synchrotron Radiation Facility (ESRF) in Grenoble, France, as a key investigating tool.

96. Match the following

List-I (Features)	List-II (Dates)
A. Vernal equinox	1. December 22
B. Summer solstice	2. September 23
C. Winter solstice	3. March 20
D. Autumnal equinox	4. June 22

Codes:

	A	B	C	D
(a)	3	4	1	2
(b)	3	1	2	4
(c)	3	1	4	2
(d)	2	4	1	3

Ans. (a) As Earth revolves around the Sun there are two moments each year when the Sun is exactly above the equator. These moments are called equinoxes which occur around March 20 or 21. The summer solstice occurs during the hemisphere's summer. This is the northern solstice in the northern hemisphere and the southern solstice in the southern hemisphere. Depending on the shift of the calendar, the summer solstice occurs sometime between June 20 and June 22 in the northern hemisphere and between December 20 and December 23 each year in the southern hemisphere.

The winter solstice (or hibernal solstice), also known as midwinter, is an astronomical phenomenon marking the day with the shortest period of daylight and the longest night of the year. In the Northern Hemisphere this is the December solstice and in the Southern Hemisphere this is the June solstice. It occurs on 22 September in northern hemisphere and 20 March in southern hemisphere. Autumnal equinox occurs on September 23.

97. Match the following

List-I (Longitudes)	List-II (Dates)
A. Prime Meridian	1. 180° longitude
B. Tropic of Cancer	2. 23½° N latitude
C. International Date Line	3. 0° longitude
D. Arctic Circle	4. 23½° S latitude
E. Tropic of Capricorn	5. 66½° N latitude

Codes:

	A	B	C	D	E
(a)	2	4	5	1	3
(b)	3	2	1	5	4
(c)	3	1	4	5	2
(d)	3	4	5	2	1

Ans. (b) A prime meridian is a meridian (a line of longitude) in a geographical coordinate system at which longitude is defined to be 0°. A prime meridian and its opposite in a 360°-system, the 180th meridian (at 180° longitude), form a great circle. This great circle divides the sphere, e.g., the Earth, into two hemispheres.

The Tropic of Cancer, also referred to as the Northern Tropic, is the most northerly circle of latitude on the Earth at which the Sun may appear directly overhead at its culmination.

The International Date Line (IDL) is an imaginary line of longitude on the Earth's surface located at about 180 degrees east (or west) of the Greenwich Meridian.

Arctic Circle is an imaginary circle round the earth, parallel to the equator, at latitude 66° 32' N; it marks the northernmost point at which the sun appears above the level of the horizon on the winter solstice.

Tropic of capricorn is the parallel of latitude that is approximately 23½ degrees south of the equator and that is the southernmost latitude reached by the overhead sun

98. Match column I with column II and select the correct answer using the code given below the columns:

Column I	Column II
(A) Earth	(i) Dwarf planet
(B) Pluto	(ii) Star
(C) Moon	(iii) Blue planet
(D) Sun	(iv) Satellite
(a) A-(iii), B-(i) C-(iv), D-(ii)	
(b) A-(i), B-(ii), C-(iii), D-(iv)	
(c) A-(iv), B-(iii), C-(ii), D-(i)	
(d) A-(iii), B-(ii), C-(i), D-(iv)	

Ans. (a) Planet Earth has been called the “Blue Planet” due to the abundant water on its surface. Pluto, once considered the ninth and most distant planet from the sun, is now the largest known dwarf planet in the solar system. It is also one of the largest known members of the Kuiper Belt, a shadowy disk like zone beyond the orbit of Neptune thought to be populated by hundreds of thousands of rocky, icy bodies each larger than 62 miles (100 kilometres) across, along with 1 trillion or more comets. Moon is the natural satellite of Earth. The sun is considered a star because it has all the characteristics of one.

99. Which of the following statements in regard to the galaxy is correct?
- Numerous tiny bodies that move around the sun are called galaxies
 - Galaxy is found between the orbits of Mars and Jupiter
 - A galaxy is a huge system of billions of stars and clouds of dust and gases
 - A galaxy does not have a sun

Ans. (c) A galaxy is a huge collection of gas, dust, and billions of stars and their solar systems. A galaxy is held together by gravity. Our galaxy, the Milky Way, also has a super massive black hole in the middle.

100. Match the planets with their properties and accordingly select the correct alternative:

Planet	Property
(A) Saturn	(i) Longest year
(B) Neptune	(ii) 71% water
(C) Earth	(iii) Longest day
(D) Venus	(iv) Having most moons
(a) A – iv, B – i, C – ii, D – iii	
(b) A – iii, B – ii, C – iv, D – i	
(c) A – ii, B – iv, C – i, D – iii	
(d) A – iv, B – iii, C – ii, D – i	

Ans. (a) As the furthest orbiting planet in the Solar System, Neptune has the longest year, taking 164.8 Earth years to complete a single orbit of the Sun. Saturn has the most moons i.e. 62. Earth has 71% water. Venus has the longest day of any planet in our solar system. It completes one rotation every 243 Earth days. Its day lasts longer than its orbit. It orbits the Sun every 224.65 Earth days, so a day is nearly 20 Earth days longer than its year.

101. Global Positioning System (GPS) is associated with
- determining latitude and longitude
 - constellation of satellites
 - US system of GPS and Russian system of GLONASS
 - navigation
- Select the correct answer using the codes given below
- 1, 3 and 4
 - 1 and 4
 - 2 and 3
 - All of these

Ans. (a) The Global Positioning System (GPS) is a space-based radionavigation system owned by the United States government and operated by the United States Air Force. It is a global navigation satellite system that provides geolocation and time information to a GPS receiver anywhere on or near the Earth where there is an unobstructed line of sight to four or more GPS satellites. The GPS system operates independently of any telephonic or internet reception, though these technologies can enhance the usefulness of the GPS positioning information. The GPS system provides critical positioning capabilities to military, civil, and commercial users around the world. The United States government created the system, maintains it, and makes it freely accessible to anyone with a GPS receiver. However, the US government can selectively deny access to the system, as happened to the Indian military in 1999 during the Kargil War.

102. The Earth is an oblate spheroid and not a perfect sphere. This is because
- The Earth has a rotational motion and the rotational speed increases as one goes from the poles towards the equator.
 - The equator experiences greater gravitational pull from the sun.
 - The intensity of sunlight received at the equator is greater than that at the poles.
- Select the correct answer using the codes given below
- Only 1
 - 1 and 2
 - Only 3
 - All of these

Ans. (a) The shape of the Earth is very close to that of an oblate spheroid, a sphere flattened along the axis from pole to pole such that there is bulge around equator. This bulge results from the rotation of the Earth and causes the diameter at the equator to be 43 km large than the pole to pole diameter.

103. Consider the following statements
- The Earth does not move along its orbit at a constant rate.
 - The Earth moves fastest at perihelion and slowest at aphelion.
- The above statements are true of which one of the following laws?
- Kepler’s second law
 - Newton’s second law of motion
 - Ohm’s law
 - Newton’s law of gravitation

Ans. (a) Kepler’s second law of planetary motion describes the speed of a planet travelling in an elliptical orbit around the sun. It states that a line between the sun and the planet sweeps equal areas in equal times. Thus, the speed of the planet increases as it nears the sun and decreases as it recedes from the sun.

104. Which one of the following statements is/ are correct with regard to Milky Way?
- It is a spiral galaxy.
 - The solar system resides in one of its spiral arms.
- Select the correct answer using the code given below:
- 1 only
 - 2 only
 - Both 1 and 2
 - Neither 1 nor 2

Ans. (c) The Milky Way is the Galaxy in which we live. It is a spiral shaped galaxy that contains several hundred billion stars, including our Sun. It is about 100,000 light-years across and about 10,000 light-years thick. If you are at a place which has a very dark night sky, you can sometimes see the Milky Way as a thick band of stars in the sky. We live out in the suburbs of the Milky Way - not near the centre, but not near the edge either.

105. Which of the following statements is/are correct?
- Lunar eclipse takes place when the Earth comes directly between the Sun and the Moon
 - Solar eclipse happens when the Moon comes directly between the Sun and the Earth
 - Lunar eclipse takes place when the Sun comes directly between the Earth and the Moon
 - Solar eclipse happens when the Earth comes directly between the Sun and the Moon
- Select the correct answer using the code given below:
- Code:**
- 1, 2 and 3
 - 3 and 4
 - 1 and 2
 - 2 only

Ans. (c) Lunar eclipse takes place when the Earth comes directly between the Sun and the Moon. Solar eclipse happens when the Moon comes directly between the Sun and the Earth.

106. The Indian subcontinent was originally part of a huge mass called
 (a) Indian (b) Aryavarta
 (c) Angaraland (d) Gondwana land

Ans. (d) The Indian sub-continent was originally part of a huge mass called Gondwana land. In paleogeography, Gondwana, originally Gondwanaland, is the name given to the more southerly of two supercontinents which were part of the Pangaea supercontinent that existed from approximately 510 to 180 million years ago.

107. Which one of the following is the dominant element of the earth crust?
 (a) Aluminium (b) Iron
 (c) Oxygen (d) Silicon

Ans. (a)

108. The mouth of a volcano is known as
 (a) Glacier (b) Cone
 (c) Crater (d) Pipe

Ans. (c)

109. Gutenberg discontinuity separates
 (a) Crust from the upper mantle
 (b) Upper mantle from lower mantle
 (c) Lower mantle from outer core
 (d) Outer core from the inner core

Ans. (c)

110. In which of the following eras the earth was nearly covered with snow and ice?
 (a) Cretaceous Era (b) Pliocene Era
 (c) Pleistocene Era (d) Tertiary Era

Ans. (c) The earth was nearly covered with snow and ice in pleistocene Era. The Pleistocene is the geological epoch which lasted from about 2,588,000 to 11,700 years ago, spanning the world's recent period of repeated glaciations.

111. The largest volume and mass of the earth is found in
 (a) Crust (b) Mantle
 (c) Outer core (d) Inner core

Ans. (b)

112. Which one of the following is not related to plate Tectonic Theory?
 (a) Continental drift (b) Pole wandering
 (c) Transform fault (d) Sea floor spreading

Ans. (b) Pole wandering is not related to plate tectonic theory.

113. Which one of the following geological periods was frequented by increased volcanic activities?
 (a) Cretaceous period (b) Ordovician period
 (c) Jurassic period (d) Miocene period

Ans. (a)

114. Epicentre is concerned with
 (a) Earthquake (b) Volcano
 (c) Cyclone (d) Land sliding

Ans. (a)

115. What does the term 'sial' refer to ?
 (a) Earth's surface layer
 (b) The core part of the earth
 (c) Ocean bottom rocks
 (d) A rock which is rich in calcium

Ans. (a) Sial refers to the upper layer of the earth's crust. It is rich in silicon and aluminum.

116. 'Nife' refers to
 (a) innermost layer of the earth
 (b) outermost layer of the earth
 (c) intermediate layer of the earth
 (d) none of the above

Ans. (a) Nife refers to the earth's core or the material composing it. It is mainly rich in Nickel and Iron.

117. Isoseismal lines join places
 (a) experiencing no earthquake
 (b) experiencing the same intensity of the earthquake
 (c) experiencing the earthquake for the same duration
 (d) experiencing an earthquake at the same time

Ans. (b) An Isoseismal line is actually a curve which passes through all connecting points on the Earth's surface at which earthquake intensity is the same. It is a closed curve around the epicenter.

118. The coriollis effect is produced by
 (a) pressure gradient
 (b) earth's revolution
 (c) earth's rotation
 (d) earth's rotation and revolution

Ans. (c) The Coriollis effect is the apparent deflection of global winds, ocean currents that moves freely across the Earth's surface. The deflection is due to the rotation of the Earth on its axis.

119. Which of the following concepts form basis for the Plate Tectonic Theory? Use the codes given below to select the correct answer:
 1. Continental drift 2. Isostasy
 3. Palaeomagnetism 4. Pole wandering

Codes:

- (a) 1 and 2 (b) 2 and 3
 (c) 1 and 3 (d) 3 and 4

Ans. (c) Continental Drift and Palaeomagnetism forms Plate Tectonic Theory. Plate tectonics is the theory that the outer rigid layer of the earth (the lithosphere) is divided into a couple of dozen "plates" that move around across the earth's surface relative to each other, like slabs of ice on a lake.

120. Study the following statements about the interior of the earth and select the correct answer from the codes given below:

- (1) The average density of the outer crust is 2.8.
 (2) The crust is separated from the mantle by the Gutenberg discontinuity.
 (3) There is sudden increase in the velocity of P waves along the mantle core boundary.
 (4) The inner core of the earth is in molten state.

Codes:

- (a) 1 and 2 (b) 2 and 3
 (c) 1 and 3 (d) 3 and 4

Ans. (c) The Earth is formed of three concentric layers: the core, the mantle and the crust; these are separated by transition zones called discontinuities. The Earth's inner core is the Earth's innermost part and according to seismological studies, it has been believed to be primarily a solid ball with a radius of about 1,220 kilometres (760 miles), which is about 70% of the Moon's radius. Moho discontinuity is the boundary between the Earth's crust and Mantle.

121. Which one of the following is not a correct statement about Coriolis force?
- It affects wind direction.
 - It is an effect of the rotational movement of the earth.
 - It becomes minimum at the poles and maximum at the equator.
 - The magnitude of Coriolis Effect is determined by the wind speed, mass of the moving body and sine of latitude.

Ans. (c) The tropical areas get more insolation than the temperate areas due to difference in angle of inclination of sun rays.

122. Study the following statements and select the correct answer from the codes given below:
- The average density of rocks in the lower crust of the earth is 3.
 - There is a gradual decrease in the velocity of the seismic waves through the lower crust.
 - The mantle-core boundary is marked by Moho-discontinuity.
 - The outer core of the earth is in molten form.

Codes:

- (a) 1 and 2 are correct (b) 2 and 3 are correct
(c) 3 and 4 are correct (d) 1 and 4 are correct

Ans. (d) The crust is the outermost solid shell of a rocky planet or natural satellite, which is chemically distinct from the underlying mantle. The Earth's crust is composed of distinctly different continental crust and oceanic crust, which have different chemical compositions and physical properties, and which were formed by different geological processes.

123. Match List-I with List-II and select the correct answer from the codes given below:

List-I (Era)	List-II (Epoch)
A. Palaeozoic	1. Jurassic
B. Mesozoic	2. Archean
C. Pre Cambrian	3. Oligocene
D. Cainozoic	4. Silurian

Codes:

- | | | | | |
|-----|---|---|---|---|
| | A | B | C | D |
| (a) | 1 | 4 | 2 | 3 |
| (b) | 4 | 1 | 2 | 3 |
| (c) | 1 | 4 | 3 | 2 |
| (d) | 4 | 1 | 3 | 2 |

Ans. (b) Palaeozoic – Silurian (The Silurian is a geologic period and system spanning 24.6 million years from the end of the Ordovician Period, at 443.8 million years ago (Mya), to the beginning of the Devonian Period, 419.2 Mya. As with other geologic periods, the rock beds that define the period's start and end are well identified, but the exact dates are uncertain by several million years. The base of the Silurian is set at a major Ordovician-Silurian extinction event when 60% of marine species were wiped out.

Mesozoic – Jurassic (The dinosaurs went extinct 65 million years ago. The Mesozoic Era lasted about 180 million years, and is divided into three periods, the Triassic, the Jurassic, and the Cretaceous. Each of these periods is divided into many epochs and ages. Mesozoic means "Middle Animal" and is sometimes called the age of reptiles.)

Pre Cambrian – Archean (The Precambrian (or Pre-Cambrian, sometimes abbreviated pC) is the earliest period of Earth's history, set before the current Phanerozoic Eon. The Precambrian (colored green on the right) is a supereon that is subdivided into three eons (Hadean, Archean, Proterozoic) of the geologic time scale.)

Cainozoic – Oligocene (The Cainozoic (Cenozoic) is the current geological era. It began 66 million years ago and continues today. Before it was the Mesozoic. During the Cainozoic the continents moved into their present positions.)

124. Which of the following elements exhibit the following properties?

- It is the third most abundant element in the earth crust.
 - It exists in a stable combination with other materials mainly silicates and oxides.
 - It has high strength-to-weight ratio.
- (a) Magnesium (b) Iron
(c) Aluminium (d) Calcium

Ans. (c) The properties of aluminium include: low density and therefore low weight, high strength, superior malleability, easy machining, excellent corrosion resistance and good thermal and electrical conductivity are amongst aluminium's most important properties. Aluminium is also very easy to recycle.

125. Choose the correct statement(s)?

- The movement of interior plates of earth causes change in surface of earth.
 - Sea waves comes under exogenic force.
 - Sudden movement of interior of earth causes earthquakes.
- (a) Only 1 (b) 1 and 2
(c) 1 and 3 (d) All are true

Ans. (d) The interior structure of the Earth is layered in spherical shells, like an onion. These layers can be defined by their chemical and their rheological properties. Earth has an outer silicate solid crust, a highly viscous mantle, a liquid outer core that is much less viscous than the mantle, and a solid inner core. Sudden movements of interior of earth cause earthquakes.

126. Match column I with column II and select the correct answer using the code given below the columns:

Column I	Column II
(A) Sial	(i) Remains of the dead plants and animals trapped in rocks
(B) Sima	(ii) Layer lies between crust and core
(C) Nife	(iii) Uppermost layer of the earth.
(D) Fossils	(iv) Innermost layer of the earth.

Codes :

- (a) A – iii, B – ii, C – iv, D – i
(b) A – ii, B – i, C – iii, D – iv
(c) A – iii, B – i, C – iv, D – ii
(d) A – iv, B – i, C – ii, D – iii

Ans. (a) The Sial refers to the composition of the upper layer of the Earth's crust, namely rocks rich in silicates and aluminium minerals. Sima is the name for the lower layer of the Earth's crust. This layer is made of rocks rich in magnesium silicate minerals. Nife is the innermost layer of earth. Fossils are the remains of dead plants and animals trapped in rocks.

127. Which of the following statements relating to Earthquakes is/are correct?

- The point of origin of Earthquake is called epicenter.
- The lines joining the places which were affected Earthquake at the same point of time are called homoseismal lines.

Select the correct answer using the codes given below

- (a) Only 1 (b) Only 2
(c) Both 1 and 2 (d) Neither 1 nor 2

Ans. (c) The epicentre or epicentrum is the point on the Earth's surface that is directly above the hypocenter or focus, the point where an earthquake or underground explosion originates. Homoseismal line. Line on the Earth's surface connecting points where the seismic wave arrives, generated by an earthquake, at the same time.

128. The Earth's surface receives maximum energy at 12 noon but the maximum temperature never occurs at 12 noon. State which of the following reasons are correct.
1. Transformation of solar energy into heat requires some time.
 2. The loss of energy through long-wave radiations from the Earth's surface exceeds the energy received from the Sun at 4:00 p.m.
 3. Energy received by the Earth from solar radiations continues to exceed the energy lost by outgoing long-wave radiations from the Earth's surface up to 4:00 p.m.

Select the correct answer using the code given below :

Code :

- (a) 1 and 2 only (b) 2 and 3 only
(c) 1 and 3 only (d) 1, 2 and 3

Ans. (c) Transformation of solar energy into heat requires some time, energy received by the earth from solar radiations continues to exceed the energy lost by outgoing long-wave radiations from the earth's surface from 4.00 p.m.

129. Which one of the following is the correct sequence of the given planets in increasing order of their size (diameter) ?

[CDS 2016-I]

- (a) Mars - Venus - Earth - Mercury - Uranus
(b) Mercury - Mars - Venus - Earth - Uranus
(c) Mercury - Mars - Venus - Uranus - Earth
(d) Venus - Mercury - Mars - Earth - Uranus

Ans. (b)

130. Which of the following statements is / are correct ?

[CDS 2016-I]

1. The earth is nearest to the sun at Perihelion, which generally occurs on January 3
2. The earth is farthest away from the Sun at Perihelion, which generally occurs on July 4
3. The earth is farthest away from the Sun at Aphelion, which generally occurs on July 4
4. The earth is nearest to the Sun at Aphelion, which generally occurs on January 3

Select the correct answer using the code given below:

- (a) 1 only (b) 2 and 4
(c) 1 and 3 (d) 1 and 2

Ans. (c) The Earth is closest to the Sun or at its Perihelion- about two weeks after the December solstice, i.e. 3 January and farthest from the Sun or at its Aphelion, about two weeks after the June solstice, i.e., 4 July.

131. Which one of the following is the reason due to which the wind in the southern hemisphere is deflected towards its left?

[CDS 2016-I]

- (a) Difference in the water masses of northern and southern hemisphere
(b) Temperature and pressure variations
(c) Inclined axis of the Earth
(d) Rotation of the Earth

Ans. (d) The anticlock wise rotation of Earth deflects winds to the right in the northern hemisphere and to the left in the southern hemisphere.

132. Match List-I with List-II and select the correct answer using the code given below the Lists : [CDS 2016-II]

List-I (Geological time scale)	List-II (Life-form)
A. Pleistocene	1. Mammals
B. Paleocene	2. Human genus
C. Permian	3. Invertebrates
D. Cambrian	4. Frogs

Code:

	A	B	C	D
(a)	2	1	4	3
(b)	2	4	1	3
(c)	3	4	1	2
(d)	3	1	4	2

Ans. (b)	Pleistocene	-	Human genus
	Paleocene	-	Frogs
	Permian	-	Mammals
	Cambrian	-	Invertebrates

133. Which of the following elements are found in highest and lowest quantities respectively in the crust of the earth?

[CDS 2016-II]

- (a) Oxygen and silicon
(b) Calcium and sodium
(c) Sodium and magnesium
(d) Oxygen and magnesium

Ans. (d) Elements in the Earth's crust -

Oxygen = 47%, Silicon = 28%, Calcium = 3.5%, Sodium = 3% and Magnesium = 2%

134. Match the following

[NDA 2008-I]

List I (Celestial Body)	List II (Roman God)
A. Mercury	1. God of the Underworld and Death
B. Pluto	2. God of Commerce, Eloquence and Skill
C. Mars	3. God of the Sea
D. Neptune	4. God of War

Codes

	A	B	C	D
(a)	3	1	4	2
(b)	2	4	1	3
(c)	3	4	1	2
(d)	2	1	4	3

Ans. (d) A. Mercury- God of Commerce, Eloquence, and Skill
B. Pluto- God of Underworld and Death
C. Mars- God of War
D. Neptune- God of the Sea

135. How many hours of daylight does the equator experience on September equinox?

[NDA 2008-I]

- (a) 8 hours (b) 9 hours
(c) 10 hours (d) 12 hours

Ans. (d) On the equinox, night and day is nearly exactly the same length - 12 hours - all over the world. Thus equator experience 12 hours daylight on September equinox.

136. Which one of the following is correct?
The mean distance from the Sun to the Earth is called a/an [NDA 2008-II]
- (a) Light year (b) Parallaxic second
(c) Astronomical unit (d) Angstrom

Ans. (c) An Astronomical Unit is the mean distance between the Earth and the Sun. 1 AU = 149,597,870.700 kilometers.

137. Which one of the following has geographical position of 0° latitude and 0° longitude? [NDA 2008-II]
- (a) In the South Atlantic Ocean
(b) In the Mediterranean Sea
(c) In Ghana, a West African country
(d) At Greenwich Observatory in England

Ans. (d) Greenwich Mean Time (GMT) is the mean solar time at the Royal Observatory in Greenwich (London). The Royal Observatory is also the source of the Prime Meridian of the world, Longitude 0° 0' 0". Every place on the Earth is measured in terms of its distance east or west from this line. The Prime Meridian runs through Greenwich (England) and is at 0° longitude.

DIRECTIONS : The following question consist of two statements, one labelled as 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the correct answers to these questions using the codes given below. [NDA 2008-II]

138. **Assertion (A)** The equatorial regions bulge outwards by about 21 km compared to poles.
Reason (R) Earth's slow rotation reduces the effect of gravity around the equator.
Codes
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is not the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true

Ans. (a)

139. Which one of the following is correct? [NDA 2008-II]
Great bear is a
- (a) Galaxy (b) Planet
(c) Star (d) Constellation

Ans. (d) Ursa Major constellation lies in the northern sky. Its name means "the great bear," or "the larger bear," in Latin. It is one of the best known constellations in the sky.

140. Which one of the following statements is not correct? [NDA 2008-II]
- (a) All meridians run in a true North-South direction
(b) Meridians are spaced farthest apart at the equator and converge to common points at the poles
(c) All meridians are always parallel to one another
(d) An indefinite number of meridians may be drawn on a globe

Ans. (c) A meridian is an imaginary line joining the north and south poles at right angles to the equator, designated by degrees of longitude from 0° at Greenwich to 180°. The position of a point along the meridian is given by its latitude. Each meridian is perpendicular to all circles of latitude.

141. Which one of the following is an object with such a strong gravitational field that even light cannot escape from its surface? [NDA 2009-I]
- (a) Neutron Star (b) White Dwarf
(c) Black hole (d) Supernova Star

Ans. (c) Black holes are objects of extreme density, with such strong gravitational attraction that even light cannot escape from their grasp if it comes near enough. The term "black hole" was coined in 1967 by John Wheeler.

DIRECTIONS : The following question consist of two statements, one labelled as 'Assertion (A)' and the other as 'Reason (R)'. You are to examine these two statements carefully and select the correct answers to these questions using the codes given below. [NDA 2009-I]

142. **Assertion (A)** Venus is the brightest object in the sky after the Sun.
Reason (R) Venus is the second planet from the Sun in our solar system.
Codes:
(a) Both A and R are true and R is the correct explanation of A
(b) Both A and R are true, but R is the correct explanation of A
(c) A is true, but R is false
(d) A is false, but R is true

Ans. (a)

143. If the movement of the Earth's crust or a major climatic change makes an old stream young, it is called [NDA 2010-I]
- (a) consequent stream (b) rejuvenation
(c) subsequent stream (d) aggradation

Ans. (b) Rejuvenation is the act of restoring to a more youthful condition.

144. An Earthquake epicentre is the [NDA 2010-I]
- (a) point where the seismograph is located
(b) point within the Earth where the movement along the fault occurs
(c) approximate centre of a group of related Earthquakes
(d) point on the surface directly above where the rupture along the fault zone occur

Ans. (d) The epicenter is the point on the Earth's surface where an earthquake explosion originates.

145. Match the following [NDA 2010-I]

	List I		List II
	(Sphere of the Earth)		(Main Constituent of the Sphere)
A.	Lithosphere	1	Living objects
B.	Hydrosphere	2	Mixture of gases
C.	Atmosphere	3	Water
D.	Biosphere	4	Soil

Codes

- A B C D
(a) 1 2 3 4
(b) 4 2 3 1
(c) 1 3 2 4
(d) 4 3 2 1

Ans. (d) The lithosphere is the solid, outer part of the Earth. The hydrosphere is the liquid water component of the Earth. An atmosphere is the mixture of gases surrounding the Earth or other celestial body. The Biosphere is the part of the earth's surface and atmosphere inhabited by living things.

146. The Earth revolves around the Sun in an elliptical path and the Sun is located at one focus of the ellipse. Imagine a situation in which the Earth goes around the Sun on a circular path. Which one among the following would result in under that situation? [NDA 2011-I]

(a) It would not make any difference
 (b) Difference between seasons will be reduced
 (c) The earth would become very hot
 (d) The Earth would become very cold

Ans. (b) In the given condition, difference between seasons will be reduced.

147. A nautical mile is equal to [NDA 2011-II]

(a) 5060 feet (b) 5280 feet
 (c) 6060 feet (d) 6080 feet

Ans. (d) A nautical mile is based on the circumference of the planet Earth. If you were to cut the Earth in half at the equator, you could pick up one of the halves and look at the equator as a circle. You could divide that circle into 360 degrees. You could then divide a degree into 60 minutes. A minute of arc on the planet Earth is 1 nautical mile. A nautical mile is 1.1508 miles or 6,076 feet.

148. The thermal equator is found [NDA 2011-II]

(a) at the equator
 (b) South of the geographical equator
 (c) North of the geographical equator
 (d) at the tropic of cancer

Ans. (c) Thermal Equator is an imaginary line round the earth running through the point on each meridian with the highest average temperature. It lies mainly to the north because of the larger landmasses and thus greater summer heating.

149. When we consider 15° meridian on a world map or globe and count them in an Eastward direction starting with Greenwich meridian (0°), we find that the time of this meridian is [NDA 2011-II]

(a) same as Greenwich (b) 1 hour fast
 (c) 1 hour slow (d) 12 hours fast

Ans. (b) Time is advanced towards the east as Earth rotates west to east

150. How many kilometres are represented by 1° of latitude? [NDA 2011-II]

(a) 321 km (b) 211 km
 (c) 111 km (d) 91 km

Ans. (c) 111 Kms are represented by 1 degree latitude.

151. The distance between two consecutive longitudes (91°E and 92°E) at the Poles is [NDA 2012-I]

(a) 0 km (b) 18 km
 (c) 25 km (d) 111 km

Ans. (a) The distance between two consecutive longitudes at the poles is 0 KM. A degree of longitude is widest at the equator at 69.172 miles (111.321) and gradually shrinks to zero at the poles.

152. The imaginary line on the Earth's surface that closely follows the 180° Meridian is [2012-I]

(a) Prime Meridian (b) Equator
 (c) International Date Line (d) Tropic of Cancer

Ans. (c) The International Date Line is an imaginary line of longitude on the Earth's surface located at about 180 degrees east (or west) of the Greenwich Meridian.

153. Lack of atmosphere around the Moon is due to

[NDA 2012-I]

(a) low escape velocity of air molecule and low gravitational attraction
 (b) high escape velocity of air molecule and low gravitational attraction
 (c) low gravitational attraction only
 (d) high escape velocity of air molecule only

Ans. (a)

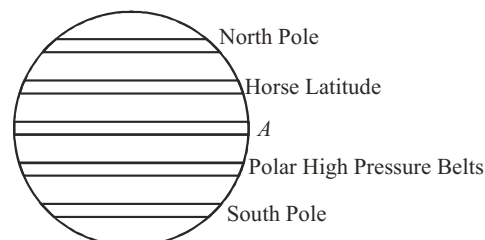
154. Why do we have a leap year every four years?

[NDA 2012-II]

(a) The Earth gets shifted out of orbit every four years
 (b) The revolution slows down a little once every four years
 (c) The length of a year is not an integer number of days
 (d) It is a convention

Ans. (c) Number of days in a year is 365 days and 6 hours (It is not a complete day). Having years of 365 days makes the year too short. To keep up with the real length of the year maintaining an integer number of days, an extra day is added every four years.

155. Consider the following diagram [NDA 2012-II]



In the diagram given above, what does A denote?

(a) Doldrums (b) Trade winds
 (c) Westerlies (d) Easterlies

Ans. (a) A region of the globe found over the oceans near the equator in the intertropical convergence zone and having weather characterized variously by calm air, light winds, or squalls and thunderstorms is called Doldrums.

DIRECTIONS : The following question consists of two statements. Statement I and Statement II. You are to examine these two statements carefully and select the answers to these questions using the codes given below. [NDA 2012-II]

156. **Statement I:** The planet Neptune appears blue in colour.

Statement II: The presence of methane gas in the atmosphere of Neptune is responsible for its colour

(a) Both the statements are individually true and Statement II is the correct explanation of Statement I
 (b) Both the statements are individually true but Statement II is not the correct explanation of Statement I
 (c) Statement I is true, but Statement II is false
 (d) Statement I is false, but Statement II is true

Ans. (a) Neptune's atmosphere is made up of hydrogen, helium and methane. The methane in Neptune's upper atmosphere absorbs the red light from the sun but reflects the blue light from the Sun back into space. This is why Neptune appears blue.

157. The waves that help scientists to understand the internal structure of the Earth are [NDA 2012-II]

(a) primary waves (b) secondary waves
 (c) surface waves (d) longitudinal waves

Ans. (b) Secondary waves (S waves) are the second fastest travelling seismic waves (after primary waves) and can travel through solids but not through liquids or gases. It helps scientists to understand the internal structure of the Earth.

158. Which one among the following is called terrestrial planet?

- (a) Mercury (b) Jupiter
(c) Saturn (d) Uranus

[NDA 2012-II]

Ans. (a) There are four terrestrial planets in our Solar System: Mercury, Venus, Earth, and Mars. The terrestrial planets in our Solar System are also known as the inner planets because these planets are the four closest to the Sun.

159. If the time of a place located on 165° E meridian is 11:00 pm on Sunday, what would be the time at the place located on 165° W meridian?

- (a) 11:00 pm on Sunday (b) 12:00 noon on Sunday
(c) 1:00 am on Sunday (d) 11:00 pm on Saturday

[NDA 2013-I]

Ans. (d) There is a difference of 360 degree longitude between 165 degree east and 165 degree west. The time interval is 24 hours because every 15 degree longitude, there is a time difference of 1 hour.

160. Which one among the following statements about the International Date Line is not correct ?

- (a) The International Date Line is largely based on the 180° meridian
(b) The difference in time between the places just either side of the International Date Line is almost 1 day
(c) The difference in time to the extent of 1 day on either side of the International Date Line is caused by inclined axis of the Earth
(d) The International Date Line mostly passes through the Pacific Ocean

[NDA 2010-II]

Ans. (c) The difference in time to the extent of 1 day on either side of the International Date Line is caused by rising of the sun in the east and not by inclined axis of the earth.

161. Which parts of the Earth's surface experience least variation in incoming solar radiation throughout the year?

- (a) Poles
(b) Equatorial regions
(c) Tropics of Cancer and Capricorn
(d) Arctic and Antarctic circles

[NDA 2013-I]

Ans. (b) Equatorial regions are located in a band around the Equator and cover about 6% of the Earth's surface. They are often in lowland areas and have a climate that is hot and wet all year round. In these parts, earth surface experiences least variation in incoming solar radiation throughout the year.

162. Nearly 30% of the solar radiations return back to the space without contributing anything to the Earth's surface temperature. This amount of radiation is known as

- (a) Black body (b) tropopause
(c) Earth's albedo (d) mesopause

[NDA 2013-I]

Ans. (c) Albedo is the fraction of solar energy (shortwave radiation) reflected from the Earth back into space.

163. Which one among the following statements is not correct?

- (a) Solar noon occurs simultaneously at locations with the same longitude
(b) One meridian, which is directly under the Sun, experiences solar noon at a given time
(c) Places having same longitude experience solar noon at different times
(d) Solar noon occurs at different times at locations with the same latitude

[NDA 2013-II]

Ans. (b) The meridian passing through Greenwich, England, designated as the zero meridian (0°) that is directly under the sun experiences solar noon at a given time.

164. The Circle of illumination divides Earth into two hemispheres known as

- (a) East and West (b) North and South
(c) Day and night (d) Summer and Winter

[NDA 2013-II]

Ans. (c) The edge of the sunlit hemisphere forms a circular boundary separating the earth into a light half and a dark half.

165. Satellite having the same orbital period as the period of rotation of the Earth about its own axis is known as

- (a) polar satellite (b) stationary satellite
(c) geostationary satellite (d) INSAT

[NDA 2013-II]

Ans. (c) A geostationary satellite is an earth-orbiting satellite, placed at an altitude of approximately 35,800 kilometres (22,300 miles) directly over the equator and revolves in the same direction as the earth rotates (west to east).

166. Albedo effect would be relatively higher in

- (a) early morning and late evening
(b) early morning only
(c) noon
(d) late evening only

[NDA 2013-II]

Ans. (a) Albedo also varies according to the angle of incidence of the Sun Rays being higher for slanting rays and lower for vertical or nearly vertical rays. From this we can derive that albedo will be relatively higher during early morning and late evening because at both times, Sun rays are slanting.

167. Composite volcanic cone is also called strata cone because of the

- (a) alternating sheets of lava and pyroclastic materials
(b) uneven streams of lava flow
(c) cataclysmic eruption
(d) eruption of lava flow from a fissure

[NDA 2013-II]

Ans. (c) Composite cone volcanoes, which are also called 'stratovolcanoes' or simply 'composite volcanoes,' are cone-shaped volcanoes composed of layers of lava, ash and rock debris. These steep-sided volcanoes erupt in an explosive manner. It is also called strata cone because of the cataclysmic eruption.

168. Which of the following statements regarding the duration of day and night is correct?

- (a) Difference is least near the Equator and progressively increases away from it
(b) Difference is maximum at the Equator and progressively decreases away from it
(c) Difference is least at the Tropics and progressively increases towards the Equator and Poles
(d) Difference is maximum at the Tropics and progressively decreases towards the Equator and Poles

[NDA 2014-I]

Ans. (a) On the equator, the day and night stay approximately the same length all year round.

169. Which of the following is/are direct source(s) of information about the interior of the Earth?

1. Earthquake wave 2. Volcano
3. Gravitational force 4. Earth magnetism

[NDA 2014-I]

Select the correct answer using the codes given below

- (a) 1 and 2 (b) Only 2
(c) 3 and 4 (d) All of these