

# Science

## Sample Question Paper 4 Answers (Class 9) (Term – 1) (Session 2021-22)

### SECTION – A

**Section - A consists of 24 questions.**

*The first attempted 20 questions would be evaluated.*

1. ANSWER: [A]

Explanation: A mixture of sulphur and carbon disulphide is a heterogeneous colloid and shows the Tyndall effect. The particles in a colloidal solution are so large that they can scatter light. This phenomenon of scattering of light by colloidal particles is called Tyndall effect.

2. ANSWER: [D]

Explanation: Iodine tincture is made by dissolving iodine in alcohol.

3. ANSWER: [A]

Explanation: Cellulose, it is a complex substance and provides structural strength to all plants. Plant cell wall is mainly made of cellulose. The cell wall of bacteria is made up of "PEPTIDOGLYCAN".

4. ANSWER: [C]

Explanation: Rusting of iron is a chemical change. Rest three show physical changes, because in these three processes, iron changes its form, not the chemical composition.

5. ANSWER: [C]

Explanation: Areolar tissue helps in repair of tissue and fills up the space inside the organ.

6. ANSWER: [B]

Explanation: Cardiac muscles are striated, cylindrical, branched, and involuntary in nature.

7. ANSWER: [A]

Explanation: The nature of matrices varies according to their function. For example, cartilage contains calcium salts as it supports bones while muscles contain contractile proteins for their movement function.

8. ANSWER: [C]

Explanation: When a nail is inserted in the trunk of a tree at a height of 1 metre from the ground, even after 3 years the nail remains at same level.

9. ANSWER: [A]

Explanation: Parenchyma cells are living and have the power to divide. Cells are round or isodiametric, that is, equally extended on all sides. Cells are oval, round, polygonal or elongated with a thin cell wall.

10. ANSWER: [C]

Explanation: The main function of the epidermis is to protect the plant from dryness and infection. In fact, the cuticle of the epidermis helps reduce water loss by evaporation from the plant surface and also helps prevent pathogen penetration.

11. ANSWER: [B]

Explanation: Plasmolysis in a plant cell is defined as shrinkage of cytoplasm in hypertonic medium. When a cell is immersed in hypertonic (very concentrated) solution, water diffuses out of the cell by the process of exosmosis. As a result, the cell shrinks. If exosmosis continues in a plant cell, the cytoplasm appears to be shrunken. This is called plasmolysis and the cell is said plasmolysed.

12. ANSWER: [D]

Explanation: Vacuole and lysosome are covered by a single membrane while mitochondria, but plastid and mitochondria have double membrane.

13. ANSWER: [D]

Explanation: The part of cell between the plasma membrane and nuclear envelope is called the cytoplasm.

14. ANSWER: [C]

Explanation: Rusting of an object made of iron is called rusting. Rust is a chemical change because rust is a chemical compound (hydrated iron oxide), completely different from the element iron (Fe).

15. ANSWER: [B]

Explanation: Camillo Golgi, discovered the method of staining individual cell structures. He used weak solution of silver nitrate to study Golgi apparatus.

16. ANSWER: [C]

Explanation: Mitochondria contains DNA and are able to synthesize their own proteins. They are also known as semi- autonomous organelles.

17. ANSWER: [D]

Explanation: The displacement of an object can be less than or equal to the distance covered by the object, because the magnitude of the displacement is not equal to the distance. However, it can be the same if the motion is along a straight line with no change in direction.

18. ANSWER: [C]

Explanation: In merry-go-round, the speed is constant but velocity is not constant, because its direction goes on changing i.e., there is acceleration in the circular motion. So, we can say that the boy is in accelerated motion.

19. ANSWER: [C]

Explanation: Slope of velocity-time graph gives acceleration. It is because slope of the curve =  $v/t$ , where  $v/t$  = acceleration.

20. ANSWER: [B]

Explanation: Given, initial velocity =  $u$ , height =  $h$  and  $a = g$ .

At the highest point, the final velocity becomes zero, i.e.,  $v = 0$ .

From the third equation of motion,  $V^2 = U^2 - 2gh$

$$0 = u^2 - 2gh$$

$$2gh = u^2$$

$$h = u^2/2g$$

Here we have used negative sign because the body is moving against gravity.

21. ANSWER: [C]

Explanation: Newton's third law of motion states that to every action there is an equal and opposite reaction. A gun recoils due to reaction force of bullet fired by it.

22. ANSWER: [C]

Explanation: For an object moving along a straight path in an accelerated motion, it is not necessary that it always goes away from the earth.



23. ANSWER: [B]

Explanation: According to third law of motion, action and reaction always act on different bodies in opposite directions.

24. ANSWER: [B]

Explanation: The property of an object to resist any change in its state of motion or rest is called inertia. If an object is at rest, then it tends to remain at rest is called inertia of rest and if the object is moving it is called inertia of motion.

### SECTION - B

**Section - B consists of 24 questions (Sl. No. 25 to 48).**

*The first attempted 20 questions would be evaluated.*

25. ANSWER: [A]

Explanation: For uniform motion the distance time graph is a straight line (because in uniform motion object moves or covers equal distance in equal intervals of time).

26. ANSWER: [A]

Explanation: In the case of motion along a straight line, the distance covered, and the magnitude of the displacement are the same. Because displacement is the shortest path between the initial and the search path. So, for a car moving on a straight road, the distance moved and the magnitude of the displacement equal to.

27. ANSWER: [C]

Explanation: After half circle the given particle will reach the point opposite to the diameter i.e. from point "A" to point "B" ( $r + r = 2r$  {diameter}).

And we know that displacement is the shortest path between starting and ending point.

28. ANSWER: [B]

Explanation: If the displacement of an object is proportional to the square of the time taken, the body is moving with a uniform acceleration because it will follow Newton's second equation of motion for a particular initial velocity. From second equation of motion,  $s = ut + \frac{1}{2}at^2$

If object starts from rest i.e., its initial velocity ( $u$ ) = 0 and has an acceleration ( $a$ ) in time ( $t$ ),

Then,  $s = 0 + \frac{1}{2}at^2$

$s = \frac{1}{2}at^2$

Now,  $s \propto t^2$ , if  $a = \text{constant}$

So, the object moves with constant or uniform acceleration.

29. ANSWER: [D]

Explanation: Given,  $v_1 = 18 \text{ km/h}$ ,  $v_2 = 36 \text{ km/h}$  and  $t = 5 \text{ min} = 5/60 \text{ h} = 1/12 \text{ h}$

Acceleration,  $a = v_1 - v_2 / t = 36 - 18 / 1/12 = 216 \text{ kmh}^{-2}$

30. ANSWER: [C]

Explanation: As the velocity of particle in uniform circular motion is constant in magnitude but changes direction. So, the acceleration is also constant in magnitude but not in direction.

31. ANSWER: [B]

Explanation: The colloid particles are too small to pass through the filter paper. Therefore, centrifugation techniques are used to separate them.

32. ANSWER: [A]

Explanation: Chloroplast is a type of plastid that contains the green pigment chlorophyll. And this pigment helps the plant to prepare its own food through the process of photosynthesis.

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33. ANSWER: [A]

Explanation: Cork is a waxy layer impervious to gases and water. This is due to chemical called SUBERIN in its walls. This layer protects the plant from physical (water loss) and biological stress (microbial infection).

34. ANSWER: [A]

Explanation: Negative slope of position-time graph represents that the body is moving towards negative direction and if the slope that decreases with time, then it represent the decrease in speed or retardation in motion.

35. ANSWER: [D]

Explanation: According to third law of motion it is impossible to have a single force, when two bodies interact with each other whether they are moving or at rest. And this law is applicable to all types of Forces.

36. ANSWER: [A]

Explanation: Wood rot and wood burning are chemical changes, as these processes change the chemical composition of the wood and form new substances, which cannot be converted back to their original form. Cutting wood and hammering a nail into a piece of wood are physical changes.

37. ANSWER: [A]

Explanation: Sublimation method of purification is used for those solids which are directly converted to gas phase without undergoing liquid phase. So, R is separated from rest of the solids by sublimation.

38. ANSWER: [C]

Explanation: [a] Miscible liquids can be separated by distillation method if the boiling points of both the liquids are different.

[B] Immiscible liquids can be separated by separating funnels when the densities of the two liquids are different.

[C] Pure copper sulphate can be separated from the impure sample by dissolving it in water, heated and then cooled to form pure crystals.

[D] The salt and ammonium chloride are separated by sublimation in which one is sublimated and one is not.

39. ANSWER: [B]

Explanation: The working of both smooth and cardiac muscles are involuntary while skeletal or striated muscles move according to our will and are voluntary in action.

40. ANSWER: [C]

Explanation: A tendon is a white fibrous tissue that has great strength but limited flexibility. Tendons connect muscles to bones.

41. ANSWER: [C]

Explanation: Cartilage is found in the joints of bones, nose, ear, trachea, and larynx. It helps to smooth the surface at the joints. It gives support and provides flexibility to the body parts.

42. ANSWER: [D]

Explanation: Each cell is surrounded by an extremely delicate, thin elastic living membrane called the plasma membrane. The plasma membrane is made up of two layers of lipid (fat) molecules with protein molecules sandwiched between the lipid layers.



43. ANSWER: [B]

Explanation: The Golgi apparatus is involved in formation of lysosome.

44. ANSWER: [A]

Explanation: Liquid molecules in the cell are synthesized by the smooth endoplasmic reticulum present in the cell.

45. ANSWER: [C]

Explanation:  $a = \text{slope of graph} = (10 - 0)/4 - 0 = 2.5 \text{ m/s}^2$

$F = ma = 5 \times 2.5 = 12.5 \text{ N}$

Hence, option [C] is correct.

46. ANSWER: [C]

Explanation: An object moving with an accelerated straight path need not always move away from the earth.

47. ANSWER: [B]

Explanation: According to the third law of motion, action and reaction always act in opposite directions on different bodies.

48. ANSWER: [C]

Explanation: Because ethyl methanoate (ester) has lowest boiling point out of three components.

### SECTION - C

**Section - C consists of three Cases followed by questions. There are a total of 12 questions in this section. The first attempted 10 questions would be evaluated.**

#### Case - 1:

49. ANSWER: [B]

Explanation: Phloem is the vascular bundle that carries food in plants.

50. ANSWER: [B]

Explanation: If the Phloem at the base of branch is removed, then lower area of the branch will not receive food from the leaves. But the plant will not die, as it will continue to receive food from other branches as food can move in phloem in both directions.

51. ANSWER: [C]

Explanation: As per the question, here correct option is [C] which refers the accurate name of the cells.

52. ANSWER: [D]

Explanation: Vascular Bundles are Xylem and Phloem together.

#### Case - 2:

53. ANSWER: [B]

Explanation: The straight line between A to B show constant velocity. So, it is showing uniform motion.

54. ANSWER: [B]

Explanation: At uniform velocity between A to B, the acceleration will be zero.

55. ANSWER: [C]

Explanation: The decrease in the velocity shows retardation which is negative.

56. ANSWER: [A]

Explanation: This is not possible as it would mean that velocity is increasing without increase in time i.e. acceleration is infinite and infinite acceleration is impossible.

**Case – 3:**

57. ANSWER: [B]

Explanation: Animal Cell does not have cell wall.

58. ANSWER: [D]

Explanation: Mitochondria is known as the power house of a cell because it releases energy.

59. ANSWER: [B]

Explanation: Ribosomes are called protein factories because proteins are manufactured in the Ribosomes.

60. ANSWER: [C]

Explanation: The endoplasmic reticulum is an extensive, interconnected, membrane-bound network of tubes and sheets that provide a route for intracellular transport of material.

