

# Science

## Sample Question Paper 2 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: [B]

Explanation: A pure substance is one which is made up of only one kind of atoms or molecules. They have the same composition throughout.

2. ANSWER: [D]

Explanation: Arsenic is a metalloid because it shows properties of both metal and non-metal.

3. ANSWER: [B]

Explanation: Mixture is constituted by more than one substance in any ratio. For example, water, soil, polluted air, etc.

4. ANSWER: [B]

Explanation: Vinegar is a homogeneous mixture of water and acetic acid because its constituent are uniformly distributed throughout the bulk of medium.

5. ANSWER: [C]

Explanation: Epithelial tissues have small amount of cementing material between them and almost no intercellular spaces.

6. ANSWER: [D]

Explanation: Aerenchyma is a special tissue found in hydrophytes (e.g. Hydrilla, Potamogeton, etc.) and some land plants (e.g. petiole of banana, Canna), formed by parenchyma cells. They make a network by leaving wide air spaces (air cavities) for the gaseous exchange and make the aquatic plants light and buoyant, so that they can easily float.

7. ANSWER: [B]

Explanation: Sclerenchyma cells are the permanent tissue present in plants. They provide rigidity and rigidity to the plant and are made up of dead cells. This tissue is present in the veins of leaves, around the vascular bundles in the stems and in the hard covering of seeds and nuts. Like coconut husk is made up of sclerenchymatous tissues. The cells of the sclerenchyma are long, narrow, and thick due to lignin.

8. ANSWER: [A]

Explanation: Sclerenchyma tissues are long and narrow as the walls are thickened due to lignin (a chemical substance which acts as cement and hardens them).

9. ANSWER: [B]

Explanation: The Xylem parenchyma stores food and helps in the sideways conduction of water.

10. ANSWER: [A]

Explanation: Companion cells are characteristic element of phloem tissue associated with the sieve tubes in the angiosperms. Thus, they are the part of vascular tissue system. They are absent in pteridophytes and gymnosperms. Guard cells and subsidiary cells are associated with stomata, found on the surface of epidermal tissue system.

11. ANSWER: [B]

Explanation: Robert Hooke in 1665, while examining a thin slice of cork, discovered dead cells. He used the word cell, which is derived from Latin, that means 'a little room' to describe these units of cork slice.

12. ANSWER: [C]

Explanation: The main postulates of cell theory are

(i) All plants and animals are made up of cells and cell products.

(ii) All metabolic reactions take place in cells. Thus, cells are the structural and functional units of life.

(iii) All cells arise from pre-existing cells. No cell can arise spontaneously, but they come into existence by the division of pre-existing cells.

(iv) Every organism starts its life as a cell.

13. ANSWER: [D]

Explanation: The correct match is A-4, B-3, C-1, D-2 Robert Hooke discovered the cell in 1665. The cell theory was proposed by Schwann & Schleiden. Robert Brown discovered the nucleus (in the cell). In 1839, Purkinje, coined the term "PROTOPLASM" for the fluid substance of the cell.

14. ANSWER: [B]

Explanation: Unlike a eukaryotic cell, a prokaryotic cell lacks membrane-bound organelles such as plastids, mitochondria and endoplasmic reticulum, but small and randomly scattered ribosomes are observed.

15. ANSWER: [B]

Explanation: The spontaneous movement of a substance from a region of high concentration to a region where its concentration is low is done by the process of diffusion.

16. ANSWER: [D]

Explanation: Leucoplast is a colourless plastid which stores proteins, lipids and starch, while xanthophyll are yellow, red or Orange pigments of green plants.

17. ANSWER: [A]

Explanation: In case of linear or straight-line motion, the displacement of the object is equal to the distance covered.

18. ANSWER: [C]

Explanation: As velocity is constant, so it travels equal distance in equal interval of time. Hence, object is in uniform motion.

19. ANSWER: [C]

Explanation: Given,

Speed =  $0.06 \text{ m/s} = 0.06 \times 3600 / 1000 \text{ km/h} = 0.216 \text{ km/h}$

20. ANSWER: [C]

Explanation: Let distance between "A and B" be d.

Average speed = Total distance / Total time =  $2V_1.V_2 / (V_1 + V_2)$ .

21. ANSWER: [B]

Explanation: Unbalanced force can only change the state of motion of an object but not the shape or size.



22. ANSWER: [B]

Explanation: When we beat blanket with the help of stick, then it comes into motion. But the dust particles continue to be at rest due to inertia and get detached from the blanket.

23. ANSWER: [C]

Explanation: Inertia of body is directly proportional to the mass of the body.

Inertia of father / Inertia of child = Mass of father / Mass of child =  $60/30 = 2/1$ .

24. ANSWER: [B]

Explanation: On the sudden, application of break, the tanker will come in the state of rest but the water remains in the state of motion. So, the water will move forward.

### SECTION - B

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

*The first attempted 20 questions would be evaluated.*

25. ANSWER: [D]

Explanation: Total length of path covered by train =  $400 + 150 = 550$  m

Train to cross the bridge (Find, Time Taken)

= Total distance/speed =  $550/50 = 11$  s

26. ANSWER: [C]

Explanation: Time travel to cover 24 m with the speed of 4 metre per second,  $t_1 = 24/4 = 6$  s

Time travel to cover 32 m with the speed of 8 metre per second,  $t_2 = 32/8 = 4$  s

Average speed = Total distance/total time =  $(24 + 32) / (t_1 + t_2) = 56/(6+4) = 5.6$  m/s

27. ANSWER: [C]

Explanation: Let "s" be total displacement, then  $s/2 = V^0 t_1$

or  $t_1 = s / 2V^0$  and,  $s/2 = V_1 t_2 + V_2 t_3 = (V_1 + V_2) t_2$

To find, Average velocity = Total displacement / Total time (should be taken) =  $s / t_1 + t_2 + t_3$

=  $2V^0 (V_1 + V_2) / (V_1 + V_2 + 2V^0)$

28. ANSWER: [B]

Explanation: In constant speed, acceleration does not change. So, it covers equal distances in equal time intervals.

29. ANSWER: [B]

Explanation:  $a = dv/dt$

The increase in speed =  $(30 - 12) = 18$  m/s.

Then,  $A = 18/15 = 1.2$  metre per second square

30. ANSWER: [B]

Explanation: Given,  $s = ct_2$

Here, c = constant of proportionally

Acceleration,  $a = d_2s/dt_2 = d_2/dt_2 (ct_2) = 2c = \text{constant}$

So, the object is moving with a uniform acceleration.

31. ANSWER: [C]

Explanation: Water and Carbon dioxide are compounds which are homogeneous in nature.

32. ANSWER: [C]

Explanation: The meristematic tissue is the continuous dividing tissues present in the growing part of the plants like, root tip, shoot tip and girth. Hence, growth only occurs in this area.

33. ANSWER: [B]

Explanation: "All plants and animals are composed of cells" was presented as cell theory by Schleiden and Schwann (1838-39). Rudolf Virchow modified and expanded this earlier theory by suggesting that "all cells arise from pre-existing cells".

34. ANSWER: [D]

Explanation: Speedometer is a device used to measure the instantaneous speed.

35. ANSWER: [A]

Explanation: When various forces are, acting on a body cause resulting force is zero, then body is in equilibrium. On the other hand, if resultant force is not zero, then body is accelerated because resultant force always produced an acceleration.

36. ANSWER: [D]

Explanation: Distilled water and tap water have different taste and different constituents. Distilled water has pure  $H_2O$  molecules while tap water may contain other molecules also.

37. ANSWER: [C]

Explanation:  $A_2B$  is a compound made up of two elements A and B in a fixed ratio. The properties of a compound (e.g.,  $A_2B$ ) are entirely different from those of its constituent elements (e.g., A and B). The composition of a compound is fixed.

38. ANSWER: [D]

Explanation: In this reaction X and Y cannot be broken down into simpler substances by chemical reactions, so X and Y are elements. A compound is a substance composed of two or more elements that are chemically combined in a fixed ratio by mass, so P is a compound with a definite composition.

39. ANSWER: [B]

Explanation: The flexibility in plants is due to Collenchyma. It also provides mechanical support to plants.

40. ANSWER: [A]

Explanation: Cutin is protective, hydrophobic, waxy covering produced by epidermal cells of leaves, young shoots and other aerial parts. It minimises the water lost through transpiration (with the help of stomata) and also reduces pathogen entry.

Lignin hardens the cell wall and provides flexibility, tensile and compressional strength to the cell wall. Suberin is present in cork cells and make the cells impervious to water.

41. ANSWER: [C]

Explanation: Cellulose is the basis of the cell wall present in plants. The cell wall of almost all organisms is made up of cellulose, while lipids along with some proteins form the basic building blocks of the plasma membrane. The plasma membrane is semipermeable and is not impermeable to water.

Lignin is a complex polymer that acts as a cement and hardens the cell wall. It provides flexibility, great tensile and compressive strength to the cell wall and makes the cell wall impermeable. It is present in sclerenchyma cells and not in cork cells. The walls of cork cells are much thicker than suberin, an organic material. Suberin makes these cells impervious to water and gases.



42. ANSWER: [B]

Explanation: The cell theory was proposed by Schleiden and Schwann in 1839, postulating that all living beings are composed of cells and their products. In 1855, Rudolf Virchow modified the cell theory with his postulate, "Omnis cellula-e-cellula", which means, a new cell is derived from a pre-existing cell only.

43. ANSWER: [B]

Explanation: In plant cells, in addition to the plasma membrane, another rigid outer covering is present called cell wall. It lies outside the cell membrane.

44. ANSWER: [C]

Explanation: Chromosomes are thread like structure usually present in the nucleus which becomes visible only during cell division. Each chromosome is made up of two components

(i) Deoxyribonucleic acid (DNA)

(ii) Proteins (e.g., histones and acidic proteins)

45. ANSWER: [A]

Explanation: Balanced forces cause a change in shape of object without change in its state of motion.

46. ANSWER: [C]

Explanation: We know that,  
Momentum = mass X velocity

$$P = mv = \text{kg-m/s}$$

$$\text{Or} = \text{kg-m/s}$$

So, SI unit of momentum is kg-m/s.

47. ANSWER: [C]

Explanation: Momentum,  $p = mv = 4 \times 4 = 16 \text{ kg-m/s}$

48. ANSWER: [A]

Explanation: According to question, the path travelled represent option [A]. If a particle starting from origin, moves 3 m North, 4 m East, 5 m South and then returns back to its initial position.

### 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: As distance is the actual path covered, while displacement is the shortest path between initial and final position. So, Distance  $\geq$  Displacement

50. ANSWER: [D]

Explanation: Displacement is a vector quantity, it means its value can be positive, negative or zero.

51. ANSWER: [C]

Explanation: The area under velocity-time graph gives the value of displacement of the body, i.e.,  
Displacement = Area of trapezium OBCDO =  $\frac{1}{2} \times (6+10) \times 10 = 5 \times 16 = 80 \text{ m}$

52. ANSWER: [B]

Explanation: The displacement is the shortest path between initial and final position.

$$\text{Displacement} = AC = (\text{Under Root}) \sqrt{AB_2 + BC_2} = (\text{Under Root}) \sqrt{15_2 + 20_2} = 25 \text{ m}$$

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**Case – 2:**

53. ANSWER: [B]

Explanation: Meristematic cells do not show the property of storage of food. Rest of the statements are characters of meristem.

54. ANSWER: [C]

Explanation: Meristematic tissue contains living cells with varied shape. They possess a large nucleus that lacks vacuole. The cells do not have intercellular spaces.

55. ANSWER: [C]

Explanation: Lateral meristem is present on the lateral sides of stems and roots. It helps in increasing the girth of stem and root.

56. ANSWER: [D]

Explanation: Apical meristem acts as pro-meristem. Rest all statements are correct.

**Case – 3:**

57. ANSWER: [B]

Explanation: Milk and water are not separated by distillation.

58. ANSWER: [C]

Explanation: In distillation, the separation of liquids is based on different boiling points.

59. ANSWER: [A]

Explanation: The liquid having low boiling point will evaporates first and then after condensation, collected in beaker whereas the residue left in flask is a liquid which have high boiling point.

60. ANSWER: [A]

Explanation: On heating, the acetone starts boiling first and converted into vapours.

