ANNUAL EXAMINATION

Question Paper 2024

NCERT BASED SYLLABUS

FOR CBSE AND STATE BOARD
FOLLOWING NCERT

Session Ending Examination (2023-24)
Class- IX
Subject- Science

Time allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. This questions paper consists of 39 questions in 5 sections.
2. All the questions are compulsory. However, and internal choice is provided in some questions. A student is expected to attempt only one of these questions.
3. Section A consists of 20 objective type questions carrying 1 mark each.
4. Section B consists of 6 Very Short type questions carrying 2 marks each. Answer to these questions should be in the range of 30 to 50 words.
5. Section C consists of 7 Short Answer type questions carrying 3 marks each. Answer to these questions should be in the range of 50 to 80 words.
6. Section D consists of 3 Long Answer type questions carrying 5 marks each. Answer to these questions should be in the range of 80 to 120 words.
7. Section E consists of 3 Source-based/Case-based units of assessment of 4 marks each with sub-parts.

(Section – A Objective Type Questions Each 1 mark)

1. Which of the following conditions is most favourable for converting gas into liquid?

(a) High pressure, low temperature
(c) Low pressure, high temperature
(b) Low pressure, low temperature
(d) High pressure, high temperature

2. What is true about homogeneous mixture?

(a) Homogeneous mixture is the mixture of two or more than two components.

(b) In homogeneous mixture the composition and properties are uniform throughout the mixture

(c) both (a) and (b) are true
(d) none of the above

3. In the tincture of iodine, find the solute and solvent?

(a) alcohol is the solute and iodine is the solvent

(b) iodine is the solute and alcohol is the solvent

(c) any component can be considered as solute or solvent

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(d) tincture of iodine is not a solution

4. The atomic symbol of Iron is ————————.

(a) I (b) Fe (c) Ir (d) Au

5. Atomic number (Z) is equal to ————————

(a) Number of protons in the nucleus of an atom.

(b) Number of electrons in a neutral atom

(c) Both (a) and (b) (d) None of the above

6. An alpha particle is also known as ————————

(a) subatomic particle (c) a neutral particle

(b) a unionised helium atom (d) a doubly-charged helium ion

7. An unripe green fruit changes colour when it ripens. The reason being:
(a) Chromoplasts changes to chlorophyll (c) Chromosomes changes to chromoplasts
(b) Chromoplasts changes to chromosomes (d) Chloroplast changes to chromoplasts

8. The phenomenon where cytoplasms shrink in a hypertonic medium is called:
(a) Frontolysis (b) Plasmolysis (c) Acidolysis (d) Allolysis

9. One of the following is not a function of the stomata
(a) Directly participates in the process of photosynthesis
(b) Helps with the exchange of gases
(c) Helps to create water pressure, forcing water upward
(d) All of the above

OR

9. Which of the following statements are correct about meristematic tissues?
(a) Composed of cells that are incapable of cell division
(b) Composed of a single type of cell
(c) It is composed of cells that are able to perform cell division
(d) All the above

10. Rapid elongation of a bamboo stem is due to

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(a) Lateral meristem (b) Intercalary meristem (c) Apical meristem (d) Cambium

11. _____ is not found in xylem tissues.
(a) Sieve tubes (b) Xylem parenchyma (c) Tracheids (d) Vessels

12. Which of the following is true of a free-falling body?
(a) It moves with non-uniform motion (c) It has constant non-zero acceleration
(b) It has zero velocity (d)It has non-uniform acceleration

13. If the mass of the body is doubled and its velocity becomes half, then the linear momentum of the body will
(a) become double (b) remain the same (c) become half (d) become four times

14. A goalkeeper in a football game pulls his hands backwards after holding the ball shot at the goal. This enables the goalkeeper to
(a) increase the rate of change of momentum
(b) decrease the rate of change of momentum
(c) increase the force exerted by the balls on the hands
(d) exert larger force on the ball

15. The inertia of an object causes the object to
(a) decrease its speed (c) resist any change in the state of its motion
(b) Increase its speed (d) decelerate due to friction

16. When a body vibrates, it compresses the air surrounding and forms a high-density area known as ————————-.

(a) Refraction (b) Reflection (c) Rarefaction (d) Compression

Q. 17 to 20 Assertion and Reason based questions: -
Directions for question no 17 to 20: In the following questions, a statement of assertion (A) is followed by a statement of reason (R). Mark the correct choice as:
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.

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17.Assertion: Two persons on the surface of moon cannot talk to each other.
Reason: There is no atmosphere on moon.

18.Assertion: A pulse crop grown in a time interval between two cereal crops.
Reason: To compensate for the loss of nitrogen.

19.Assertion: Some weeds produce substances toxic for the crops.
Reason: Weeds take up nutrients and reduce the growth of crops
.
20.Assertion: Cattle are fed with roughage and concentrates.
Reason: Roughage provides fibres while concentrates provide proteins and other nutrients.

Section B (Very Short Answer Type Questions Each 2 Marks)

21. Explain why the smell of hot sizzling food reaches you several meters away, but to get the smell

from cold food, you have to go close.

22. Write down the formulae of

(i) sodium oxide (ii) aluminium chloride

(iii) sodium sulphide (iv) magnesium hydroxide

23. What would happen to the life of a cell if there was no Golgi apparatus?

24. During an experiment, a signal from a spaceship reached the ground station in five minutes.

What was the distance of the spaceship from the ground station? The signal travels at the speed

of light, that is, 3×10^8 m/s.

25. Explain why some of the leaves may get detached from a tree if we vigorously shake its branch.

26. State the universal law of gravitation.

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Section C (Short Answer Type Questions Each 3 Marks)

27. Convert the following temperature to Celsius scale:

(a) 300K (b) 573K

28. Calculate the formula unit masses of ZnO, Na_2O, K_2CO_3, given atomic masses of Zn = 65u,Na

= 23u, K=39u, C = 12u, and O=16u.

29. (i) Which organelle is known as the powerhouse of the cell? Why?
(ii) Why are lysosomes known as suicide bags?

30. Show the difference between the three types of muscle fibres diagrammatically.

31. A train starting from a railway station and moving with uniform acceleration attains a speed 40

km h^{-1} in 10 minutes. Find its acceleration.

32. An echo is heard in 3 s. What is the distance of the reflecting surface from the source, given that

the speed of sound is 342 ms^{-1}?

33. (i) Compare the use of manure and fertilisers in maintaining soil fertility.
(ii) Which method is commonly used for improving cattle breeds and why?

Section D (Long Answer Type Questions Each 5 Marks)

34. (a) If the number of electrons in an atom is 8 and the number of protons is also 8, then
(i) What is the atomic number of the atom? and
(ii) What is the charge on the atom?

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(b) What are the limitations of Rutherford's model of the atom?
(c) Define Isotopes with example. Write two uses of isotopes.

35. (a) Which tissue makes up the husk of a coconut?
(b) Draw a labelled diagram of neuron.
(c) Name the following: -
(i) Tissue that forms the inner lining of our mouth.
(ii) Tissue that connects muscle to bone in humans.
(iii) Tissue that transports food in plants.
(iv) Tissue that stores fat in our body.

36. (a) A force of 7 N acts on an object. The displacement is, say 8 m, in the direction of the force. Let us take it that the force acts on the object through the displacement. What is the work done in this case?
(b) The kinetic energy of an object of mass, m moving with a velocity of 5 ms^{-1} is 25 J. What will be its kinetic energy when its velocity is doubled? What will be its kinetic energy when its velocity is increased three times?
(c) Define 1 watt of power.

Section E (Case Study based Questions Each 4 marks)

37. Read the following observation and answer the questions (i) to (iv):
A student prepared three types of salt solutions A, B and C. A deshelled egg was placed in each solution. After an hour he observed that the egg in solution A has swelled up. There was no change in solution B while the deshelled egg kept in solution C decreased in size.

(i) The phenomenon bringing about changes in the size of egg is
(a) Osmosis (b) Circulation (c) Inhibition (d)Diffusion.

(ii) Eggs are deshelled because the shells are
(a) Made of calcium carbonate (b)Permeable
(c) Semipermeable (d) Impermeable.

(iii) Deshelling of eggs is carried out by dipping the eggs in the
(a) Sodium hydroxide solution (b) Dilute hydrochloric acid
(c) Lime water (d) Alcohol.

(iv) Which of the following solutions contains a low solute concentration relative to another solution
(a) Hypotonic (b) isotonic (c) Hypertonic (d) none of the above

38. Read the following observation and answer the question (i) to (iv)
Weight of a body is the force with which the body is attracted towards the centre of earth. is given by W= mg, where g is acceleration due to gravity At the centre of earth, g = 0. As we move above or below the surface of earth, value of g goes on decreasing.

(i) The standard value of g on the surface of earth is
(a) 9.8 m/s^2 (b) 8.9 m/s^2 (c) 10 m/s^2 (d) 5 m/s^2

(ii) At the centre of earth, value of g is
(a) 9.8 m/s^2 (b) zero (c) 98 m/s^2 (d) 4.9 m/s^2

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(iii) A body of given mass weighs

(a) maximum at the centre of earth (c) more at a depth below the surface of earth

(b) more at a height above the surface of earth (d) maximum at the surface of earth.

(iv) A body weighs 40 kg on the surface of earth. At the centre of earth, its mass and weight

respectively are

(a) 40 kg, 40 kg (b) 40 kg, zero (c) zero, zero (d) zero, 40 kg

39. Read the following observation and Answer Q. (i) to (iv)

Suspension is a heterogeneous mixture in which the small particles of solids are spread throughout a liquid without dissolving in it. If a beam of light is pass through a suspension, It is scatters the beam of light and renders its path visible inside it. On the other hand, colloidal solution appears to be homogeneous to us but it is a heterogeneous mixture. The particles of a colloid are uniformly spread throughout the solution and its particles are big enough to scatter a beam of light passing through it.

(i) Which one of the following could not be classified as a colloid?

(a) Blood (b) Soap solution (c) Chalk powder in water (d) Milk

(ii) Which of the following solutions shows Tyndall effect?

(a) A solution of common salt (b) Sugar solution (c) Lemonade (d)Starch solution

(iii) The size of particles in suspension, true solutions and colloidal solutions varies in the order of:

(a) Suspension > colloidal > true solution (b) True solution < suspension < colloidal

(c) Suspension < colloidal < true solution (d) None of the

(iv) Automobile exhaust is an example of:

(a) Liquid dispersed in gas (b) Solid dispersed in liquid

(c) Liquid dispersed in solid (d) Solid dispersed in gas

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Session Ending Examination (2023-24)

Class- IX

Subject- Science

MARKING SCHEME

(Section – A Objective Type Questions Each 1 mark)

Q1 to 20 **(each 1 mark)**

1. a	2. c	3. b	4. b	5. c	6. d	7. d	8. b	9. a or 9. c	10. b
11. a	12. C	13. B	14. b	15. c	16.d	17.a	18.a	19.b	20.a

Section B (Very Short Answer Type Questions Each 2 Marks)

21. Particles in the air, if fuel with higher temperatures, acquire high kinetic energy, which aids them to move fast over a stretch. Hence, the smell of hot sizzling food reaches a person even at several meters. **(2 Marks)**

22. (i) sodium oxide – Na_2O (ii) aluminium chloride – $AlCl_3$
(iii) sodium sulphide – Na_2S(iv) magnesium hydroxide – $Mg(OH)_2$**(1/2+1/2+1/2+1/2)**

23. The Golgi apparatus consists of stacks of membrane-bound vesicles whose functions are as follows:- Storage of substances, Packaging of substances, Manufacture of substances Without the Golgi apparatus, the cells will be disabled from packing and dispatching materials that were produced by the cells. The Golgi apparatus is also involved in the formation of cells. Hence, in the absence of the Golgi apparatus, cells will not be produced.**(2 Marks)**

24. Given that the signal travels in a straight line, the distance between the spaceship and the ground station is equal to the total distance travelled by the signal. **(1/2 Marks)**
5 minutes = 5*60 seconds = 300 seconds. **(1/2 Marks)**
Speed of the signal = 3×10^8 m/s.
Therefore, total distance = (3×10^8 m/s) * 300s
= $9*10^{10}$ meters. **(1 Marks)**

25. When the branch of the tree is shaken, the branch moves in a to-and-fro motion. However, the inertia of the leaves in attached to the branch resists the motion of the branch. Therefore, the leaves that are weakly attached to the branch fall off due to inertia whereas the leaves that are firmly attached to the branch remain attached. **(2 Marks)**

26. The universal law of gravitation states that every object in the universe attracts every other object with a force called the gravitational force. The force acting between two objects is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centers. **(2 Marks)**

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Section C (Short Answer Type Questions Each 3 Marks)

27. a. 0°C=273K **(1.5+1.5)**

300K= (300-273)°C = 27°C

b. 573K= (573-273)°C = 300°C

28. The formula unit mass of ZnO= Atomic mass of Zn + Atomic mass of O = 65u + 16u = 81u

The formula unit mass of Na_2O = 2 x Atomic mass of Na + Atomic mass of O = (2 x 23)u + 16u = 46u + 16u = 62u

The formula unit mass of K_2CO_3 = 2 x atomic mass of K + Atomic mass of C + 3 x Atomic mass of O = (2 x 39) u + 12u + (3 x 16) u = 78u + 12u + 48u = 138u **(1+1+1)**

29. (i) Mitochondria are known as the powerhouse of the cell. It is because it releases the energy required for different activities of life. Mitochondria releases energy in the form of ATP (Adenosine triphosphate) molecules, essential for numerous chemical activities of life. Hence, ATP is often referred to as the 'energy currency of the cell'.

(ii) When there is damage to the cell and when revival is not possible, lysosomes may burst, and the enzymes digest their own cell. Consequently, lysosomes are known as suicide bags.

(1.5+1.5)

30. Diagram of different types of muscles and difference. **(1/2+1+1/2+1+1/2+1)**

31. V= u + at **(1/2 Mark)**

u = 0 **(1/2 Mark)**

a = 0.0185 ms^{-2} **(2 Marks)**

32.Speed of sound (v) = 342 ms^{-1}

Echo returns in time (t) = 3 s

Distance travelled by sound = v × t = 342 × 3 = 1026 m

In the given interval of time, sound must travel a distance which is twice the distance between the reflecting surface and the source.

Therefore, the distance of the reflecting surface from the source =1026/2 = 513 m **(1+2)**

33. (i) Difference between manure and fertilizer **(1.5)**

(ii) Cross-breeding is generally the best method adopted for improving cattle breed quality. In this method, breeding between two good cattle breeds results in a new, improved variety of cattle breeds or offspring. While breeding, care is taken to have a good resultant with a high yield having resistance to climatic conditions. **(1.5)**

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Section D (Long Answer Type Questions Each 5 Marks)

34. (a) (i) The atomic number of an atom is the same as the number of protons in that atom; hence, its atomic number is 8.

(ii) In an atom, the number of protons is equal to the number of electrons. Hence, both the charges – positive and negative – neutralise each other. Therefore, the atom does not possess any charge. **(1)**

(b) There is no expected stability in the revolution of the electron in a circular orbit. Charged particles radiate energy when accelerated, thus causing the revolving electrons to lose energy and would fall into the nucleus. Hence, atoms must be highly unstable. The matter would not exist in its known form, which clearly is an assumption as atoms are highly stable. **(2)**

(c) The atoms which have the same number of protons but a different number of neutrons are referred to as isotopes. Hence, the mass number varies. **(1+1)**

Example: The most simple example is the Carbon molecule which exists as ${}_6C^{12}$ and ${}_6C^{14}$

Uses of isotopes: - (i) The isotope of the Iodine atom is used to treat goitre, an iodine-deficient disease. (ii) In the treatment of cancer, an isotope of cobalt is used. (iii) Fuel for nuclear reactors is derived from the isotopes of the Uranium atom.

35. (a) Sclerenchyma tissue **(1)**

(b) Structure of neuron. **(2)**

(c) (i) The epithelial tissue, Squamous epithelium. **(each ½ mark)**

(ii) Tendon (iii) Phloem (iv) Adipose tissue

36. (a) W = F s **(1 marks)**

W = 56 j **(1 Marks)**

(b) K.E. of the object = 25J

Velocity of the object (v) = 5 m/s

K.E. = (½) mv^2 (1/2 Marks)

25 = (½) m $(5)^2$

50 = 25 x m

m = 50/25

m = 2 kg (1/2 Marks)

Now, when velocity is doubled

v = 10 m/s, m = 2 kg

K.E. = (½) x 2 x $(10)^2$

K.E. = 10^2

K.E. = 100 J (1/2 Marks)

When velocity is increased three times, then

v = 15 m/s, m = 2 kg

K.E. = (½) x 2 x $(15)^2$

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K.E. = (15)

K.E. = 225 J (1/2 Mark)

(c) A body is claimed to possess power of one watt if it works at the speed of 1 joule in 1 s.

That is, One W = 1 J/1 S **(1)**

Section E (Case Study based Questions)

37. (i) a (ii) a (iii) b (iv) a **(Each 1 mark)**

38. (i) a (ii) b (iii) d (iv) b **(Each 1 mark)**

39. (i) c (ii) d (iii) a (iv) d **(Each 1 mark)**

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