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**TERM II EXAMINATION – 2023**
**CLASS IX**
**SCIENCE (086)**
**SET I**

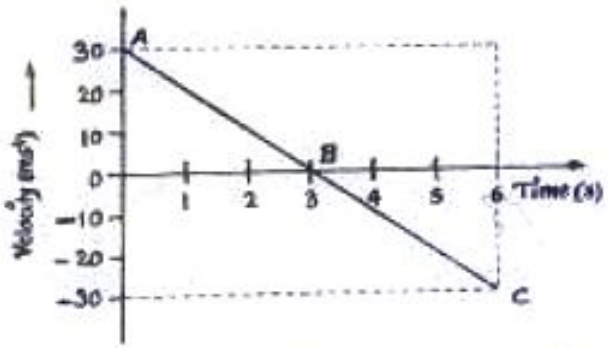
**Date: 23.02.2023**
**Time: 3 hours** **Maximum marks: 80**

**General Instructions:**

1. This question paper consists of **39** questions in **5** sections.
2. All questions are compulsory. However, an 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 questions carrying **02** marks each. Answer to these questions should in the range of **30 to 50** words.
5. **Section C** consists of **7** Short answer type questions carrying **03** marks each. Answer to these questions should in the range of **50 to 80** words.
6. **Section D** consists of **3** Long answer type questions carrying **05** marks each. Answer to these questions should in the range of **80 to 120** words.
7. **Section E** consists of **3** case-based/source-based units of assessment of **04** marks each with sub-parts.

## SECTION A (1 Mark Each)

1. The velocity – time graph of a stone thrown vertically upward with an initial velocity of 30 $ms^{-1}$ is shown in the figure below. The velocity in the upward direction is taken as positive and that in downward direction as negative. What is the maximum height to which the stone rises?




a. 30 m b. 45 m c. 60 m d. 54 m

2. **Paragraph:** Take a beaker filled with water. Take an iron nail and place it on the surface of water and observe what happens. Answer qn. 2 on the basis of your understanding of the above paragraph and the related study concepts.

**Which the following is an incorrect answer?**

a. The nail sinks.
b. The force of gravitational attraction of the Earth on the nail pulls it downwards.
c. There is an upthrust of water on nail which pushes it upwards.
d. The downward gravitational force acting on the nail is less than the upthrust on it.

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3. Two masses of 1 kg and 4 kg are moving with equal kinetic energies. The ratio of their momenta is

a. 4:1 b. 2:1 c. 1:4 d. 1:2

4. The velocity of sound in air is 340 m /s.
   a. Its wavelength is about 3 m when the frequency is 250 Hz.
   b. Its wavelength is about 2 m when the frequency is 250 Hz.
   c. Its frequency is 300 Hz when the wavelength is 0.85 m.
   d. Its frequency is 400 Hz when the wavelength is 0.85 m.

5. Choose the statements that are true for pure substances from the following:
   (1) Pure substances contain only one type of particles
   (2) Pure substances may be compounds or mixtures
   (3) Pure substances have uniform composition
   (4) All elements except mercury are examples of pure substances
   (a) (1) and (2)
   (b) (1) and (3)
   (c) (2) and (4)
   (d) (2) and (3)

6. Akshay added 3 substances 'X' 'Y' and 'Z' to water. He made following observations: X settled down and could be filtered through a filter paper; Y and Z dissolved and could not be filtered through a filter paper. Z could be separated from its solution by the process of centrifugation. 'X' 'Y' and 'Z' are respectively:
   (a) Stable, unstable and colloid
   (b) Solution, suspension and sol
   (c) Unstable, solution and colloid
   (d) Suspension, colloid and solution

7. Which of the following statements are not true about FeS:
   (1) It is attracted by magnet
   (2) It is soluble in Carbon di sulphide solution
   (3) It is yellow in colour
   (4) It gives $H_2S$ gas on reaction with $H_2SO_4$
   (a) (1), (2) and (3)
   (b) (2), (3) and (4)
   (c) (2), (4)
   (d) (2), (3)

8. What is the percentage of solute if the solution is 500mL and the solvent is: 300mL:
   (a) 30%
   (b) 40%
   (c) 50%
   (d) 60%

9. The melting point of Solid $O_2$ is -218.4°C. The temperature will be equivalent to:
   (a) 54.6 K
   (b) -54.6 K
   (c) 491.4 K
   (d) 218 K

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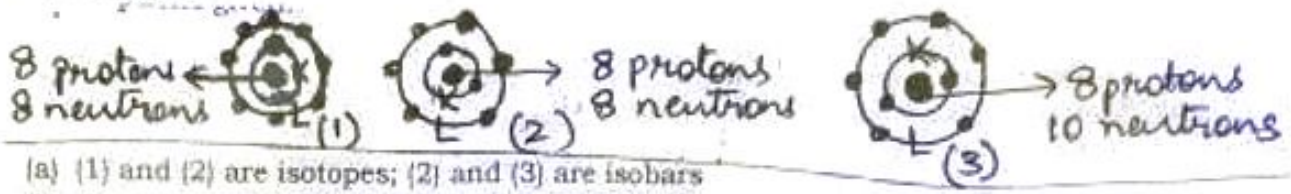
10. The chemical formula of Ferrous sulphate is:
    (a) $FeSO_4$
    (b) $Fe_2SO_4$
    (c) $Fe_2(SO_4)_3$
    (d) $Fe_2(So_4)_3$

11. Given below are the diagrammatic representations. Identify the types from the options given:




    (a) (1) and (2) are isotopes; (2) and (3) are isobars
    (b) (1) and (2) are isobars; (3) is an atom of oxygen
    (c) (1) is an ion (2) and (3) are isotopes
    (d) (1) is an atom (2) is an ion (3) is an isotope

12. Which if these options are not a function of ribosomes?
    i. It helps in the manufacture of protein molecules
    ii. It helps in the manufacture enzymes.
    iii. It helps in the manufacture of hormones.
    iv. It helps in the manufacture of starch molecules.
    a) i and ii
    b) ii and iii
    c) iii and iv
    d) iv and i

13. Find out the false sentence
    a) Nucleus is involved in the formation of lysosomes.
    b) Nucleus, mitochondria and plastid have DNA, hence they are able to make their own structural proteins.
    c) Mitochondria is said to be the powerhouse of the cell as ATP is generated in them.
    d) Cytoplasm is called as protoplasm.

14. Which of the following tissues has dead cells?
    a) parenchyma
    b) schlerenchyma
    c) collenchyma
    d) epithelial tissue

15. Which cell does not have perforated cell wall?
    a) tracheids
    b) companion cells
    c) sieve tubes
    d) vessels

16. Select the incorrect sentence
    a) blood has a matrix containing, proteins , salts and hormones.
    b) two bones are connected by ligament.
    c) Tendons are non - fibrous tissue and fragile.
    d) Cartilage is a form of connective tissue.

**Questions 17 to 20 are Assertion and Reason type.**

In the below questions, (A) is assertion and (R) is reason.

Select the appropriate option.

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

17. **Assertion:** Forces of action and reaction act on the same body.
**Reason:** These forces are always equal and opposite.
18. **Assertion:** Alloys are heterogeneous mixtures of metals.
**Reason:** Alloys can be separated into their components using chemical methods.
19. **Assertion:** Xylem and Phloem are both conducting tissue.
**Reason:** Conductive tissue is a distinctive feature of a complex plant for their survival in the terrestrial environment.
20. **Assertion:** Some cells like amoeba have changing shapes.
**Reason:** Unicellular organisms show cell shape changing features.

## SECTION B (2 Marks Each)

21. The earth and the moon are attracted to each other by gravitational force. Does the Earth attract the Moon with a force that is greater or smaller or the same as the force with which the Moon attracts the Earth? Give reason for your answer.
22. What is reverberation? How can it be reduced?
23. Give any **two** features of Rutherford Model of an atom.

**OR**

Give two postulates of Bohr's Model of an atom.

24. Give a scientific reason for the following.
(a) Inner membrane of mitochondria is deeply folded.
(b) Mitochondria are able to make some of their own proteins.
25. Name the tissue that makes the husk of coconut. Write three characteristics of this tissue.
26. What factors does the food requirement of dairy animals depend on?

## SECTION C (3 Marks Each)

27. Robert and his wife Jennifer were going by car from one city to another on a highway. While Robert was driving at the rate of 72 km/h Jennifer observed that a loaded truck 51 m ahead of them was breaking to halt. She immediately asked her husband to apply brakes. Robert did the same and by the time car stopped, the truck was just 1 m ahead of the car.
(a) How much distance was the car covering initially in 1 sec?
(b) Find the retardation of the car after the brakes were applied.
28. (a) State Newton's second law of motion.
(b) A motor car of mass 12 quintal is moving along a straight line with a uniform velocity of 342 km/h. Its velocity is slowed down to 288 km/h in 0.75 min by an unbalanced external force. Calculate the following.
(i) Change in momentum
(ii) Magnitude of force required.
29. (a) Two identical copper spheres of radius R in contact with each other having uniform density $\rho$. If the gravitational attraction between them is F, find the relation between F and $\rho$.
(b) On what factors does the value of G depend?

**OR**

(a) Two objects of mass $m_1$ and $m_2$ having the same size are dropped simultaneously from the heights $h_1$ and $h_2$ respectively. Find out the ratio of time they would take in reaching the ground. Will this ratio remain same if one of them is hollow and the other one is solid? Give reason.

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(b) If the distance between the two objects is tripled, determine what happens to the gravitational force between the two objects?

30. (a) When sodium chloride is dissolved in water, what will be the change in volume and why?

(b) A student dropped a crystal of copper sulphate in two beakers A and B containing cold and hot water respectively. In which beaker dissolution will be faster and why?

31. If carbon atom is available in the form of two isotopes $^{14}_{6}C$ (1.1%) and $^{12}_{6}C$ (98.9%), calculate the average atomic mass of carbon atom.

32. Classify plastids according to their types,State the functions of each.

**OR**

Draw a neat and labelled diagram of a bacterial cell.

33. Name the following:

(a) Organelles which have their own genetic material.

(b) An organelle rich in digestive enzymes.

(c) Nucleic acid present in the nucleus of the cell.

**SECTION D (5 Marks Each)**

34. (a) Define 1 W of power.

(b) The Jog Falls in Karnataka state is nearly 20m high. 2000 tonnes of water falls from it in a minute. Calculate the equivalent power if all this energy can be utilized?

(c) i. Give an example where light energy is converted into chemical energy?
ii. Give an example where light energy is converted into electric energy?

(d) When is the work done by a body said to be negative?

35. (a) Define atomicity. Give an example of a diatomic liquid element and triatomic gaseous element. Write the chemical formula of a compound whose anion as well as cation is polyatomic. Also name this chemical compound.

(b) Name the elements present in the following compounds:
i) Aluminium phosphate ii) Baking powder

**OR**

(a) The symbol of potassium is K not P and that of chlorine is Cl and not Ch. Give reasons.

(b) Calculate the formula unit mass of $Na_2CO_3.10H_2O$ (Given atomic masses of Na = 23u, C = 12u, O = 16u, H = 1u)

36. (a) Give the structural differences between the three types of muscular tissue.

(b) Draw a neat and labelled diagram of the unit of nervous tissue.

**OR**

(a) Differentiate between bone and cartilage with respect to its structure, function and location.

(b) Name the protective tissue found in the animal body .Which of these are present in the following: skin, respiratory tract and lining of kidney tubules?

**SECTION E (4 Mark Each)**

**CASE STUDY BASED**

37. Sound is the form of energy that is responsible for making us hear. When a sound wave strikes a surface, it bounces back similar to a light ray bouncing back. Hence, it follows the law of reflection just like light. When a sound wave comes in contact with a boundary, a portion of the wave undergoes reflection while some portion of it undergoes transmission across the boundary. The reflection or transmission of sound depends upon the material and the shape of the boundary.

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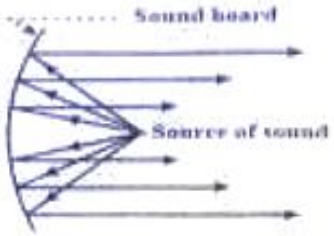


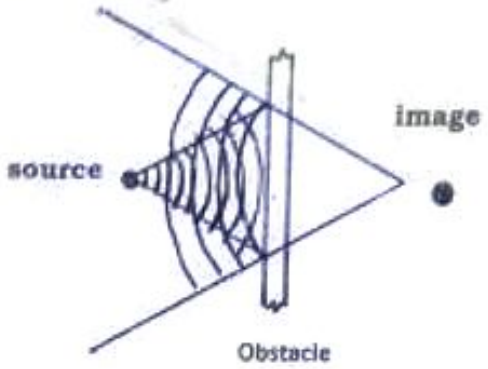


(a) A sound ray makes an angle of $30^0$ with the wall. What will be the angle of reflection of this ray?

(b) Why is sound wave called a longitudinal wave?

(c) A person was standing between two vertical cliffs such that he was 640 m away from the nearest cliff. When he shouted, he heard the first echo after 4 sec and the second echo 3 sec later. Calculate the velocity of sound in air.

**OR**

Smayra is standing between two hills. She shouted loudly and hears first echo after 0.5 sec and second echo after 1 sec. What is the distance between two hills? Take the speed of sound in air= 350 m/s.

38. Atomic number and mass number are two important characteristics of an atom. These two parameters are represented by the notations Z (atomic number) and A (mass number). From the knowledge of these parameters we can calculate the number of sub-atomic particles in a given atomic species.

a) An element has a proton, an electron and no neutron. Name the element. Draw it's atomic structure.

b) What kind of ion does boron form, anion or cation? Compare the size of the atom and ion formed.

**OR**

Mass number of aluminium is 27. What is the mass number of it's ion? Justify.

39. Different ways of growing crops can be used to give maximum benefit. Mixed cropping is growing two or more crops simultaneously on the same piece of land. Intercropping is growing two or more crops simultaneously on the same field in a definite pattern.

1) What is the advantage of mixed cropping?

2) On what basis are the crops selected in intercropping?

3) What is Crop Rotation? what is its advantage?

**OR**

Give two examples of crop combinations used in intercropping.

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