विद्या सर्वार्थि साधिका

ANANDALAYA
ANNUAL EXAMINATION
Class : IX

Subject: Science M.M: 80
Date : 25/02/2020 Time: 3 Hours

General Instructions:

1. The question paper comprises three sections – A, B and C. Attempt all the sections.
2. All questions are compulsory.
3. Internal choice is given in each section.
4. All questions in Section A are one-mark questions comprising MCQ, VSA type and assertion-reason type questions. They are to be answered in one word or in one sentence.
5. All questions in Section B are three-mark, short-answer type questions. These are to be answered in about 50 - 60 words each.
6. All questions in Section C are five-mark, long-answer type questions. These are to be answered in about 80 – 90 words each.
7. This question paper consists of a total of 30 questions.

SECTION A

1. Why are light and sound not considered as matter? (1)

2. What is the difference between an atom and a molecule? (1)

3. Answer question numbers 3(a) - 3(d) on the basis of your understanding of the following paragraph and the related concepts studied.

   Electrical appliances account for over 30% of the energy bills charges you receive on monthly or annually basis. Many home appliances manufacturers, as well as the government, have shifted their focus into saving energy. Thus, they have invested in producing energy efficient appliances. These appliances include refrigerators, air conditioners, water heaters, lighters, dishwashers, clothes washing machines and dryers, and other electrical items used at home or workplaces. These items are used for purposes such as laundry, cooking, and making the home a comfortable place. Therefore, they are important in our homes.

   Energy efficient appliances are designed to utilize minimum energy to complete the required task. Others use renewable sources of energy such as solar energy and water. These appliances are capable of maximizing small amount of energy into the required one to complete a task. An example of energy efficient appliances is the energy saver bulbs, booster water heaters and solar water heaters. Many of these appliances can operate under lower temperature and energy settings which sustain their functionality until the completion of tasks.

   (a) Why is it necessary to use energy efficient appliances at home? (1)
   (b) What is the commercial unit of electrical energy? (1)
   (c) An electric heater of 1500W is used for 2 h in a day. Express electrical energy consumed in joules. (1)
   (d) What is rate of consumption or transfer of energy by a machine called? (1)

4. The following data refer to an experiment in which a measured mass of solid is added to 10.0g of 20 °C water. The mixture is stirred and allowed to sit for 3 hours. Ten separate trials are conducted for the experiment

Trial No.	Mass of solute added (grams)	Mass of solute dissolved (grams)
1	1.0	1.0
2	2.0	2.0
3	3.0	3.0
4	4.0	3.6
5	5.0	3.6
6	6.0	3.6
7	7.0	3.6
8	8.0	3.6
9	9.0	3.6
10	10.0	3.6

(a) Identify the following variables in the experiment: (1)
(i) Dependent variable (ii) Independent variable

(b) Imagine that the contents of the beaker for Trial 8 in the Model are vigorously stirred and then poured into filter paper in a funnel. (1)
Is the liquid that drips from the filter (the filtrate) unsaturated or saturated? Explain.

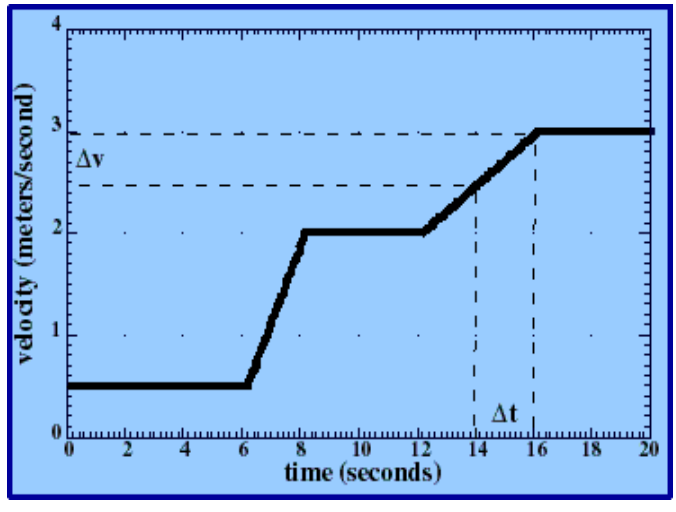
(c) Predict what would happen to the mass of solid solute sitting on the bottom of the beaker in Trial 8 when the following changes occur.
(i) More water is added to the beaker. (1)
(ii) The beaker is allowed to sit uncovered for two days and some water evaporates. (1)

5. Newton's law of gravitation applies to ..... (1)
(i) Small bodies only (ii) Planets only
(iii) All bodies irrespective of their size (iv) For solar system

OR

Gravitational force between the two objects is -----
(i) Attractive at large distances only.
(ii) Attractive at small distances only.
(iii) Attractive at all distances.
(iv) Attractive at large distances but repulsive at small distances.

6. Analyse the given velocity versus time graph and find in which interval of time, the acceleration of a moving object becomes maximum. (1)
(i) 6s to 8s
(ii) 8s to 12s
(iii) 12s to 16s
(iv) 16s to 20s



7. A boat is striking by waves such that a crest and a trough reach at an interval of 0.1 second with a speed of 50m/s. The distance between two consecutive crests is (1)
(i) 5 m (ii) 10 m (iii) 15 m (iv) 20 m

8. Chromosomes are made up of (1)
(i) DNA (ii) protein (iii) DNA & protein (iv) Histones.

OR

Which cell organelle plays a crucial role in detoxifying many poisons and drugs in cell?
(i) Golgi Apparatus (ii) Lysosomes
(iii) Smooth Endoplasmic reticulum (iv) Vacuoles

9. Girth of stem increases due to (1)
(i) Apical meristem (ii) Lateral meristem
(iii) Intercalary meristem (iv) Vertival meristem

10. Which of the following is exclusively marine? (1)
(i) Porifera (ii) Echinodermata (iii) Mollusca (iv) Annelida

11. Making anti-viral drugs is more difficult than making anti-bacterial disease because (1)
(i) Viruses have few biochemical pathways (ii) They mutate fast.
(iii) Viruses make use of host machinery (iv) Viruses are on the boarder line of living and non-living

12. The formula of a chloride of a metal M is MCl_2. Then the formula of the phosphate of the metal M is (1)
(i) MPO_4 (ii) M_2PO_4
(iii) M_3PO_4 (iv) $M_3(PO_4)_2$

OR

Identify the correct statements:
1. In a compound such as water, the ratio of the mass of hydrogen to oxygen is always 8:1
2. If 9 grams of water is decomposed, then 1 gram of hydrogen and 8 grams of oxygen are always obtained.
3. In ammonia NH_3, nitrogen and hydrogen are always present in the ration of 3:14
4. Many compounds are composed of two or more elements and each such compound has the same elements in the same proportions.

(i) 1 and 3 (ii) 1, 2 and 3 (iii) 2 and 4 (iv) all of these

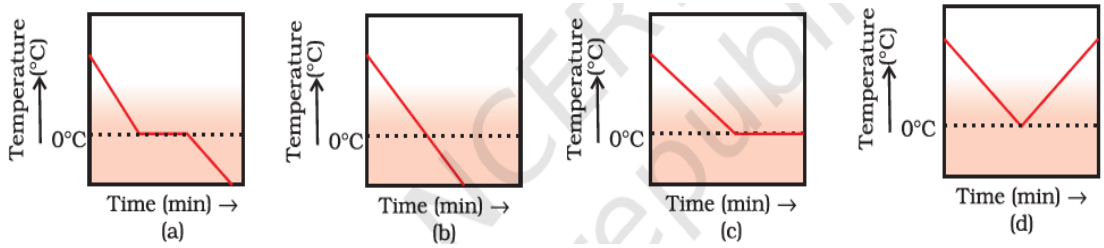
For question numbers 13 and 14, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below
(i) Both A and R are true and R is correct explanation of the assertion.
(ii) Both A and R are true but R is not the correct explanation of the assertion.
(iii) A is true but R is false.
(iv) A is false but R is true.

13. Assertion: Atomicity of oxygen is 2. (1)
Reason: 1 mole of an element contains 6.023×10^{23} atoms

14. Assertion: The recoil velocity of a gun is much less than that of the bullet. (1)
Reason: Less force due to the bullet is exerted on the gun than that exerted by gun on the bullet.

SECTION B

15. (a) Why do gases exert more pressure on the walls of the container than solids? (3)
(b) Name the property of the gaseous state when an inflated balloon is pricked with a pin.
(c) A glass tumbler containing hot water is kept in the freezer compartment of a refrigerator (temperature < 0°C). If you could measure the temperature of the content of the tumbler, which of the following graphs would correctly represent the change in its temperature as a function of time.



16. Give the formulae of the compounds formed from the following sets of elements (3)
(a) Calcium and fluorine
(b) Hydrogen and sulphur
(c) Nitrogen and hydrogen
(d) Carbon and chlorine
(e) Sodium and oxygen
(f) Carbon and oxygen

OR

(a) A sample of ethane (C_2H_6) gas has the same mass as 1.5×10^{20} molecules of methane (CH_4). How many C_2H_6 molecules does the sample of gas contain? Atomic mass of C=12u, H=1u
(b) Which has more number of atoms? 100g of N_2 or 100 g of NH_3. Atomic mass of N=14u.

17. (a) Differentiate between compost and vermicomposting. (3)
(b) Why is excess use of fertilizers detrimental for the environment.
(c) Name two macronutrients supplied by the soil.

18. (a) Draw a cell and label two organelles bound by double membranes. (3)
(b) Name them and write one function of each of them.
(c) Mention whether it is a plant cell or animal cell giving reason.

19. Give reason. (3)
(a) Why is growth in plants restricted to certain area?
(b) Why do muscles contain special contractile protein?
(a) Why are cardiac muscles called involuntary?

OR

(a) Differentiate between tendon and ligament.
(b) Give the functions of areolar connective tissue.

20. You are given Leech, Prawn and Tapeworm to study in your Biology lab which have segmented body. Do they all belong to the same group? If not,based on their salient features assign them their respective groups. (3)

21. Schematically represent how Nitrogen cycles in the environment, labelling every step. (3)

22. (a) Two bodies of equal masses move with uniform velocities v and 2v respectively. Find the ratio of their kinetic energies. (3)
(b) When is the work done by a body said to be negative ?

23. Derive the equation of motion $s = ut + \frac{1}{2} at^2$ using graphical method (3)

24. (a) State Newton's second law of motion. (3)
(b) A force of 5N gives a mass m_1, an acceleration of $8 m/s^2$ and a mass m_2, an acceleration of $24 m/s^2$. What acceleration would it give if both the masses are tied together?

OR

(a) Define inertia.
(b) Why is it advised to tie a rope on the luggage while you travel by the bus?.
(c) A body of mass 9 kg is lying on a surface of table. Calculate the net force acting on it.

SECTION C

25. (a) Will Cl^{35} and Cl^{37} have different valencies? Justify your answer. (5)
(b) Why did Rutherford select a gold foil in his scattering experiment?
(c) In the atom of an element X, 6 electrons are present in the outermost shell. If it acquires noble gas configuration by accepting requisite number of electrons, then what would be the charge on the ion so formed?

(d) Calculate the number of neutrons present in the nucleus of an element X which is represented as $_{15}X^{31}$.

(e) Helium atom has 2 electrons in its valence shell but its valency is not 2. Explain.

OR

(a) What were the drawbacks of Rutherford's model of an atom?

(b) What are the postulates of Bohr's model of an atom?

(c) Show diagrammatically the electron distributions in a sodium atom and a sodium ion and also give their atomic number.

26. Classify each of the following, as a physical or a chemical change. Give reasons. (5)

(a) Drying of a shirt in the sun.

(b) Rising of hot air over a radiator.

(c) Burning of kerosene in a lantern.

(d) Change in the colour of black tea on adding lemon juice to it.

(e) Churning of milk cream to get butter.

27. Briefly explain five modes of spread of communicable diseases. (5)

OR

Write the mode of transmission, symptoms and preventive measures of Malaria.

28. (a) What causes movement of air? (5)

(b) In coastal areas why is the movement of air

(i) from land to the sea at night? (ii) from sea to land during the day?

29. (a) Density of a substance is one of its characteristic properties. Justify the statement. (5)

(b) State Archimedes' Principle. List its two applications.

(c) A solid weighs 80g inair, 64g in water. Calculate the relative density of solid. Given the density of water is 1gm/cm^3. When kept in water, state if the object would float or sink?

30. (a) How is an echo different from reverberation? (5)

(b) State a condition for an echo to be heard.

(c) Explain the principle and working of SONAR with the help of labeled diagram.

OR

(a) How does speed of sound change with (i) temperature of medium and (ii) physical state of medium?

(b) Distinguish between intensity of sound and loudness of sound.

(c) The frequency and wavelength of sound wave are 1 kHz and 0.35m respectively. Find the time it will take to travel a distance of 1.5km.