ANANDALAYA
PERIODIC TEST - 3
Class: IX

Subject: Science

Date : 06-01-2025

MM : 40

Time: 1 Hr. 30 min.

General Instructions:
1. There are 17 questions in all. All questions are compulsory.
2. This question paper has five sections: Section A, Section B, Section C, Section D and Section E. All the sections are compulsory.
3. Section A consists of 8 multiple choice questions of 1 mark each, Section B consists of 2 very short questions of 2 marks each, Section C consists of 2 short answer type questions of 3 marks each, section D consists of 2 long answer questions of 5 marks each and Section E consists of 3 source-based/case study-based questions of 4 marks each with sub-parts.

SECTION A

1. An object of density $\frac{2}{11}$ g/cm^3 is put one by one in two liquids d_1 and d_2 having densities $\frac{1}{9}$ g/cm^3 (1) and $\frac{3}{11}$ g/cm^3 respectively. In which liquid will the object sink?
   (A) It will sink in d_1
   (B) It will sink in d_2
   (C) It will sink in both d_1 and d_2
   (D) it will not sink in both

2. An object is floating on water. The upthrust experienced by the object is _____. (1)
   (A) equal to its weight   (B) greater than its weight   (C) less than its weight   (D) zero

3. A student studies that magnesium and iron react with oxygen to form MgO and FeO. Although (1) both compounds contain two atoms each, their molecular masses are different. The reason for the difference in their molecular masses is due to the difference in the _____.
   (A) atomic mass of iron and magnesium
   (B) number of iron and magnesium atoms
   (C) atomic number of iron and magnesium
   (D) number of O_2 atoms in the two compounds.

4. The figures A, B, C and D given below represent types of animal tissues. Identify the correct (1) options from the given with its correct location and function of the figures A, B, C and D.
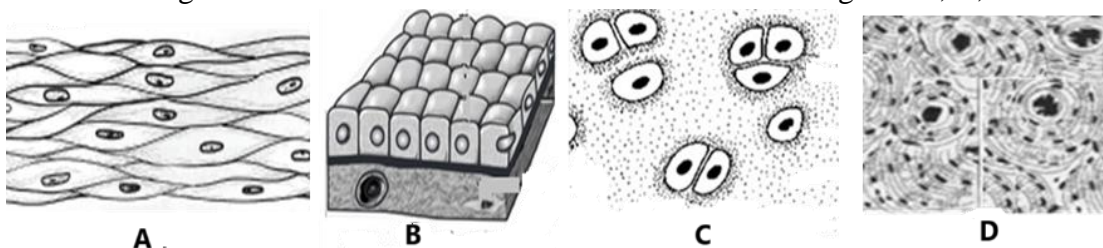
Option	Tissue	Location	Function
A	Stratified Epithelium	Skin	Protection from wear and tear
B	Columnar Epithelium	Respiratory tract	Removes dead cells
C	Cartilage	Nose tip	Provides Flexibility
D	Nervous tissue	Brain	Conducts nerve impulses

5. Identify the triatomic molecule from the following? (1)
   (A) Nitrogen   (B) Hydrogen   (C) Ozone   (D) Oxygen

6. Which type of muscle has visible light and dark bands? (1)
   (A) Smooth muscle
   (B) Cardiac muscle
   (C) Striated muscle
   (D) Skeletal muscle

For question numbers 7 and 8, two statements are given-one labelled Assertion and the other labelled Reason. Select the correct answer to these questions from the codes (A), (B), (C) and (D) as given below.

(A) Both Assertion and Reason are true and Reason is the correct explanation of Assertion

(B) Both Assertion and Reason are true but Reason is NOT the correct explanation of Assertion.

(C) Assertion is true but Reason is false.

(D) Assertion is false and Reason is also false.

7. A: Work done cannot be negative. (1)
    R: Work is defined as the product of force and distance both scalar quantities.

8. A: Valency of Aluminium is 3 and it forms Al^{3+} (1)
    R: Metals form cations by losing electrons in order to get stability.

SECTION B

9. A block of wood is kept on a tabletop. The mass of the wooden block is 5 kg and its dimensions are 40 cm × 20 cm × 10 cm. Find the pressure exerted by the wooden block on the table top if it is made to lie on the table top with its sides of dimensions 20 cm × 10 cm. (2)

10. Write down the chemical name of: (A) $AlPO_4$ (B) ZnO (C) H_2S (D) CCl_4 (2)

SECTION C

11. Write chemical formula of following compounds by crossing over valences (3)
    (A) Sodium hydrogen carbonate (B) Calcium hydroxide (C) Zinc phosphate

12. (i) Write the type of muscles involved in the following: (3)
        (a) Jumping of frog   (b) Pumping of the heart
        (c) Writing with hand   (d) Peristaltic movement of food in your intestine.
    (ii) Which tissue coordinates with the muscles for the body movements in animals?

SECTION D

13. (a) Define Work. (5)
    (b) Among the following in which case work is done?
         (i) A wind-mill is lifting water from a well.
         (ii) A green plant is carrying out photosynthesis.
    (c) A force of 8 N is acting on a mass 2 kg for 6 seconds. Find the work done by the force. The mass is initially at rest.

14. Observe the below given figure of a neuron and answer the questions that follow: (5)
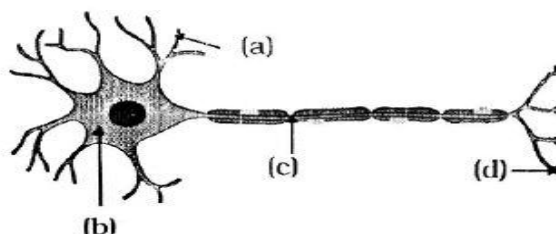
    (i)   Write the most important feature of a neuron.
    (ii) Name the parts labelled as (b) and (c).
    (iii) Identify the part that transmits the received nerve impulse all along the neuron.
    (iv) Write one difference between the part labelled as (a) and (d).
    (v)   Is nervous tissue a connective tissue? Write the scientific reason to justify your answer.

SECTION E

Questions 15 to 17 are Source-based/Case study based questions of 4 marks with sub-parts.

15. Whenever energy gets transformed, the total energy remains unchanged. This is the law of conservation of energy. According to this law, energy can only be converted from one form to another; it can neither be created or destroyed. The total energy before and after the transformation remains the same. The law of conservation of energy is valid in all situations and for all kinds of transformations. For a freely falling body, the sum of the potential energy and kinetic energy of the object would be the same at all points.

(i) A body of mass 10 kg is dropped from a height of 100 m. What will be its total energy when it reaches 50 m? Take g as 10 m/s^2. (1)

   (A) 5000 J   (B) 10000 J   (C) 2500 J   (D) zero

(ii) Write how the energy of water stored in a dam transformed into electrical energy in a hydroelectric power station. (1)

(iii) A body of mass 2 kg at rest is given an acceleration of 1 m/s^2. During this time the body travels 20 m. What is the final kinetic energy of the body? (2)

OR

(iii) An oscillating pendulum bob comes to rest after some time. What happens to its energy eventually? Is it a violation of the law of conservation of energy?

16. In 1794, Joseph Proust, a French chemist formulated the law of constant proportions from the work he did on sulphates, metal oxides and sulphides. Also, this law was favoured since Dalton's atomic theory was introduced as well. The relation between them was also discovered by Jacob Berzelius, a Swedish chemist in the year 1811.

(i) State the postulates of Dalton's atomic theory that explains Proust's law? (1)

(ii) Define 1 unified mass(1u) (1)

(iii) Calculate the amount of Hydrogen and oxygen obtained when 90g water is decomposed (2)

OR

(iii) What is the ratio by mass of Carbon and Oxygen in CO_2?

17. Connective tissues are most abundant and widely distributed in the body of complex animals. Connective tissues are classified into Loose connective tissue, Dense connective tissue and Specialised connective tissue. In all connective tissues except blood, the cells secrete fibres of structural proteins called collagen or elastin. The fibres provide strength, elasticity and flexibility to the tissue.

(i) Why are the connective tissues named so? (1)

(ii) Why do the blood cells do not secrete collagen or elastin? (1)

(iii) Write the location and function of areolar connective tissue. (2)

OR

(iv) Where and how is fat stored in the human body?