9th Science Solved Summative Assessment- II-Sample paper 3

Questions:

1] Seema tried to push a heavy rock of 100 kg for 200 s but could not move it. Find the work done by Seema at the end of 200 s. [Marks:1]

2] Name the carbon compounds responsible for causing ozone hole in the atmosphere. [Marks:1]

3] Name the bacteria responsible for nitrification in nature. [Marks:1]

4] At what speed a body of mass 1 kg will have a kinetic energy of 1 J ? [Marks:1]

5] Which organisms are called primitive ? How are they different from the advanced organisms ? [Marks:2]

6] When we stand on loose sand, our feet go deep into the sand. But when we lie down on the sand our body does not go that deep in the sand. Why ? [Marks:2]

7] (a) What is an epidemic disease ?
(b) Which organ is affected if a person is suffering from jaundice ? [Marks:2]

8] 5 g of calcium combine with 2 g of oxygen to form a compound. Find the molecular formula of the compound. (Atomic mass of Ca = 40 u ; O = 16 u) [Marks:2]

9] If K and L shells of an atom are full, then what would be the total number of electrons in the atom ? What is the valency of this element ? [Marks:2]

10] Three persons, A, B and C are made to hear a sound travelling through different mediums as given below :

Person	Medium
A	Iron Rod
B	Air
C	Water

[Marks:2]

Who will hear the sound first ? Why ?

11] Define relative density of a substance. Relative density of silver is 10.8. The density of water is 1000 kgm^{-3}. What is the density of silver in SI units ? [Marks:2]

12] What is soil erosion ? List two activities which cause soil erosion. [Marks:2]

13] What is green house effect ? How is it caused ? [Marks:2]

14] List three groups of plants. Which plants are referred to as vascular plants ? Out of these which group is further classified on the basis of number of cotyledon ? State its two characteristics. [Marks:3]

15] List in the tabular form any three differences between the Aves and the Mammalia group. [Marks:3]

16] (a) Which of the following diseases are protozoan in origin ?
Dengue, Malaria, Kala - azar and HIV - AIDS
(b) Suggest any two ways to prevent being infected by protozoa. [Marks:3]

17] List three main features of Rutherford's nuclear model of an atom. [Marks:3]

18] (a) Why taking an antibiotic is not effective in the common cold ?
(b) Name two diseases against which infants below one year are vaccinated.
(c) List two symptoms of any one of these diseases. [Marks:3]

19] (a) Why the stage of an auditorium has curved background, curtains, carpets and false ceiling ?
(b) The sound of a ringing bell inside a vacuum chamber cannot be heard. Why ? [Marks:3]

20] Ocean waves of time period 0.01s have a speed of 15 m/s. Calculate the wavelength of these waves. Find the distance between the adjacent crest and the trough. [Marks:3]

21] On the basis of the number of protons, neutrons and electrons in the samples given below identify (a) the cation (b) the pair of isobars and (c) the pair of isotopes.

Sample	Protons	Neutrons	Electrons
A	17	18	16
B	18	19	18
C	17	20	17
D	17	17	17

[Marks:3]

22] A mass of 10 kg is dropped from a height of 50 cm. Find its :
(a) Potential energy just before dropping
(b) Kinetic Energy just on touching the ground
(c) Velocity with which it hits the ground
[Given g = 10 ms^{-2}] [Marks:3]

23] When 3.0 g of carbon is burnt in 8.0 g of oxygen, 11.0 g of carbon dioxide is produced. What mass of carbon dioxide will be formed when 3.0 g of carbon is burnt in 50.00 g of oxygen ? Which law of chemical combination will govern your answer ? State the law.

OR

Define the following terms with example. [Marks:5]
(a) Atomicity
(b) Anion
(c) Molecular Mass
(d) Relative Formula Mass
(e) Cation

24] Define work, energy and power. Give the SI units for each of these quantities. A man whose mass is 80 kg climbs up 30 steps of the stairs in 30 s. If each step is 12.5 cm in height, calculate the power used in climbing the stairs. ($g = 10\ m/s^2$) [Marks:5]

OR

Define Kinetic Energy and Potential energy. Write an expression for K.E of a body of mass m moving with a speed v. Find the kinetic energy of a stone of 10 kg moving with a velocity of 10 m/s.

25] Many human activities lead to increasing levels of pollution of air, water bodies and soil. "Isolating these activities to specific and limited areas would not help in reducing pollution". Justify this statement giving at least five reasons. [Marks:5]

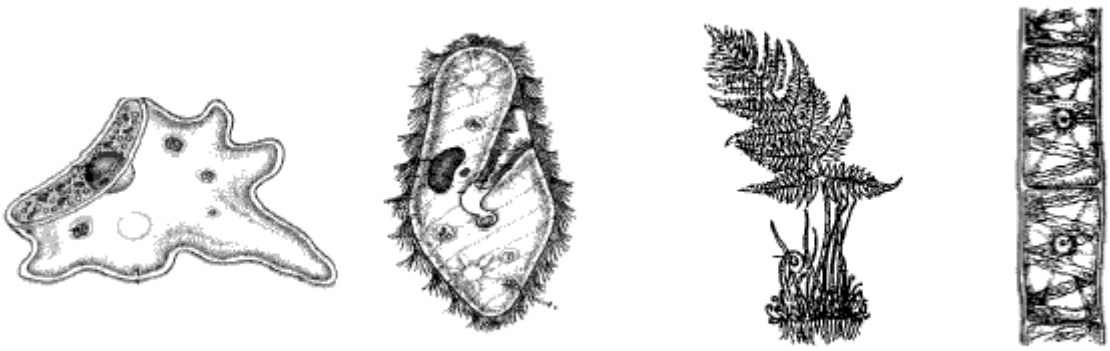
OR

Explain with the help of a labelled diagram carbon cycle in nature.

26] Needle like leaves are the characteristics of : [Marks:1]

A. Moss
B. Fern
C. Mustard
D. Pinus

27] Study the figures of organisms and identify the groups to which they belong.



(i) (ii) (iii) (iv) [Marks:1]

Which set of answers given below classifies them correctly ?

A. (i) fungi (ii) pteridophyta (iii) thallophyta (iv) protista

B. (i) thallophyta (ii) fungi (iii) protista (iv) pteridophyta

C. (i) protista (ii) pteridophyta (iii) thallophyta (iv) fungi

D. (i) protista (ii) fungi (iii) pteridophyta (iv) thallophyta

28] The characteristic not common between bony fish and pigeon is - [Marks:1]

A. Vertebral Column
B. Streamlined body
C. Lay eggs
D. Warm blooded

29] The body of a cockroach is divided into : [Marks:1]

A. thorax and abdomen
B. head, wings and legs
C. head, abdomen and tail
D. head, thorax and abdomen

30] Earthworm mainly feeds on : [Marks:1]

A. dried leaves
B. small insects
C. plant sap
D. soil rich in humus

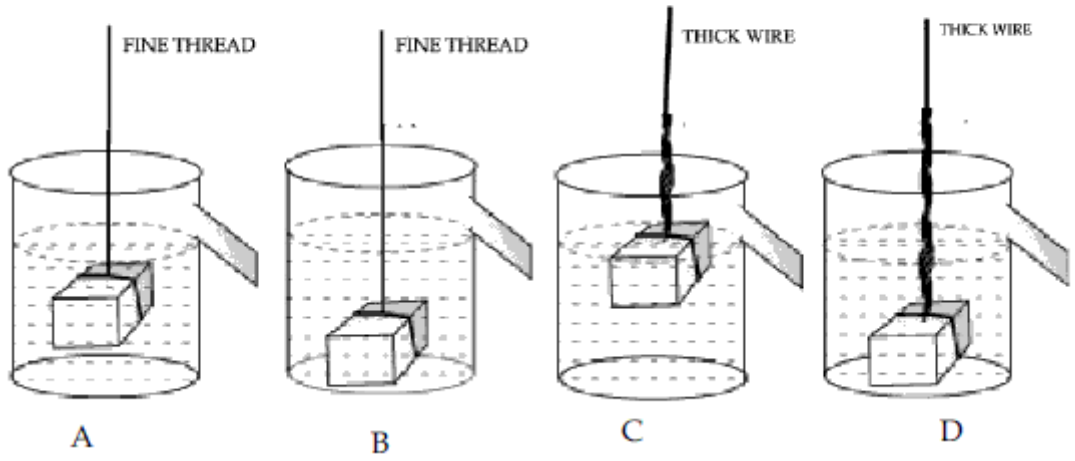
31] The highest evolved among the following are : [Marks:1]

A. Thallophytes
B. Bryophytes
C. Gymnosperms
D. Angiosperms

32] The mass of a solid iron cube of side 3 cm is to be determined using a spring balance. If the density of iron is approximately 8.5 gcm^{-3}, the best suited spring balance for determining weight of the solid would be of : [Marks:1]

A. Range 0 - 250 gwt ; Least count 5 gwt
B. Range 0 - 1000 gwt ; Least count 5 gwt
C. Range 0 - 1000 gwt ; Least count 10 gwt
D. Range 0 - 250 gwt ; Least count 1 gwt

33] The correct set up shown for an experiment to establish relationship between loss in weight of an immersed solid with the weight of water displaced by it is :



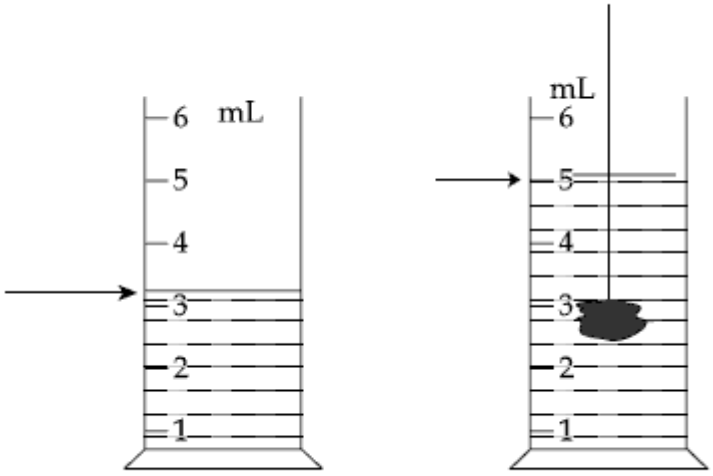
[Marks:1]

A. B
B. C
C. D
D. A

34] For studying the reflection of sound, the best reflector out of the following would be : [Marks:1]

A. A thermocole sheet
B. A cushioned sheet
C. A thick and rough curtain
D. A polished metallic sheet

35] Observe the figure below :



[Marks:1]

The volume of stone immersed in the liquid is :

A. 1 mL
B. 3 mL

C. 5 mL

D. 2 mL

36] An object weighing 5 N in air, weighs 4.5 N in a liquid. The buoyant force experienced by the object is : [Marks:1]

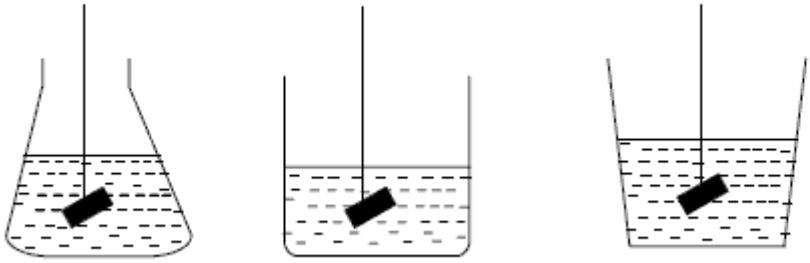
A. 5/4.5 N

B. 4.5/5 N

C. (5+4.5) N

D. 0.5 N

37] A body is weighed in liquid by immersing it fully in each of the three containers shown. The apparent weight of the solid will be : [Marks:1]



A. Least in I

B. Least in II

C. Least in III

D. Equal in all

38] Narrow tubes are used in the verification of laws of reflection of sound. The narrow tubes are used because they make sound waves to : [Marks:1]

A. Move in a straight line

B. Concentrate into a powerful beam

C. None of these

D. Have multiple reflections and prevent spreading of sound

39] A pulse was created in a stretched string of length 5 m by four students A, B, C and D. They observed that the pulse returned after reflection at the point of creation 5 times in 10 seconds and calculated the speed as given in the table below. [Marks:1]

Student	A	B	C	D
Speed m/s	0.5	2.5	5	10

The student who has reported the speed correctly is :

A. A

B. B

C. D

D. C

40] To observe and compare the pressure exerted by three different faces of a cuboid on sand, the following Cuboid is available to you :

(A) wooden cuboid of dimension 20 cm × 30 cm × 50 cm

(B) aluminium cuboid of dimension 3 cm × 6 cm × 12 cm [Marks:1]

(C) Iron cuboid of dimensions 5 cm × 10 cm × 15 cm

(D) Iron cuboid of dimensions 20 cm × 30 cm × 50 cm

The best choice from the practical point of view would be :

A. A
B. B
C. D
D. C

41] A student placed an iron cuboid of dimensions 4 cm × 6 cm × 10 cm on a tray containing fine sand. He placed the cuboid in such a way that it was made to lie on the sand with its faces of dimension (a) 4 cm × 6 cm (b) 6 cm × 10 cm (c) 4 cm × 10 cm. [Marks:1] If the density of iron is nearly 8 gcm^{-3} and g = 10 ms^{-2} the minimum and maximum pressure as calculated by the student should be :

A. 16 Nm^{-2}, 40 Nm^{-2}
B. 32 Nm^{-2}, 80 Nm^{-2}
C. 640 Nm^{-2}, 1600 Nm^{-2}
D. 3200 Nm^{-2}, 8000 Nm^{-2}

Solutions:

1] Work done = 0

2] Chlorofloro carbons

3] Rhizobium

4] 1.4 m/s or $\sqrt{2}$ m/s

5] Primitive - groups of organisms which have simpler ancient body designs that have not changed much over evolutionary time.

Advanced - groups of organisms which have complex body designs that have changed over evolutionary time

6] Standing area of contact is less so pressure exerted is more & lie down area of contact is more so pressure exerted is less.

7] (a) An epidemic is the rapid and extensive spread of disease that affects many individuals simultaneously in a particular area. It is generally an infectious disease.

(b) Liver is affected.

8]

Element	Mass Ratio (given)	Atomic mass (u)	Number of atoms = Mass ratio/atomic mass	Simplest ratio
Ca	5	40	0.125	1
O	2	16	0.125	1

Thus, the formula of calcium oxide should be CaO as the simplest ratio of the elements is 1 : 1

9] The maximum number of electrons that can occupy K and L - shells of an atom are 2 and 8 respectively. Therefore, if K and L - shells of an atom are full, then the total number of electrons in the atom would be (2 + 8) = 10 electrons.

The valency is zero

10] A

Iron is more elastic than the other two mediums

11] Definition of density

Relative Density = (Density of Silver/Density of water). Density of Silver = Relative Density of silver × density of water = 10.8×1000 kgm^{-3} = 10.8×10^3 kgm^{-3}.

12] The top most layer of the soil that contains humus and living organisms in addition to the minerals is called Topsoil. The removal and transportation of topsoil from its original place to another place with the help of certain agents such as strong winds running water etc. is called Soil Erosion.

13] Some gases such as carbon dioxide, methane, also known as greenhouse gases, present in the earth's atmosphere prevent the escape of heat from the earth by absorbing the infrared light from the sun. An increase in the percentage of these greenhouse gases in the atmosphere would cause an increase in the average temperature world - wide and this phenomena is known *'Green house Effect'*.

14] Pteridophyta, Gymnospermae and Angiospermae

Angiosperms

Two characteristics:
(a) The seeds develop inside an organ which is modified to become a fruit.
(b) Plant embryos in seeds have structures called cotyledons.

15] Differences between aves and mammalia group:

Aves	Mammalia
a. Body is covered with feathers.	a. Skin is covered with hair.
b. Mammary glands are absent.	b. They have mammary glands for the production of milk to nourish their young ones.
c. Bones have air cavities.	c. Bones are solid, hard and filled with bone marrow.

16] (a) Malaria and Kala - azar

(b) (i) take care not to have stagnant water around.
(ii) Proper waste disposal.

17] Rutherford's alpha particle scattering experiment's many features
(i) The nucleus of an atom contains nearly all the mass of the atom.
(ii) The size of the nucleus is very - very small as compared to the size of the atom.
(iii) Electrons revolve round the nucleus in well defined orbits.

18] Common cold is a viral disease
Measels, tetanus, tuberculosis (any two)
Two symptoms of Tuberculosis are:
(a) Persistent cough.
(b) Weight loss.

19] (a) Curved background - spreads the reflected sound to the audience
Curtains and false ceilings - to prevent echo
(b) sound needs a medium for transmission.

20] $\lambda = T/v = 0.15$ m
distance between crest and trough $= \lambda/2 = 0.075$ m

21] cation - A
Isobars - B and C
isotopes - C and D

22] PE = mgh = 10 × 10 × 0.5 = 50 J ; KE = P.E.
Velocity, $v^2 = 2gh = 10$, thus $v = 3.16$ m/s

23] When 3.0 g of carbon is burnt in 8.0 g oxygen, 11.0 g of carbon dioxide is produced. It means all of carbon and oxygen are combined in the ratio of 3 : 8 to form carbon dioxide. Thus when there is 3 g carbon and 50 g oxygen, then also only 8 gm of oxygen will be used and 11 gm of carbon dioxide will be formed. The remaining oxygen is not used.
This indicates law of definite proportions
According to this law, in a chemical substance the elements are always present in definite proportion by mass. All pure samples of a compound contain the same elements combined together in the same proportion by mass.

OR

(a) Atomicity - Number of atoms in a single molecule of an element. Example atomicity of Oxygen gas is 2
(b) Anion - A negatively charged an Anion. Example SO_4^{2-} is an anion
(c) Molecular Mass - The molecular mass of a substance is the relative mass of its molecule expressed in atomic mass unit (u). It is equal to the sum of the atomic masses of all the atoms present in one molecule of the substance. For example, one molecule of water (H_2O) contains two atoms of hydrogen and one atom of oxygen.
(d) Relative Formula Mass (or Formula Mass) - The Formula Mass of a substance is the sum of atomic masses of all atoms in a formula unit of a compound. or Formula Mass is used for substances whose constituent particles are ions, example for NaCl formula mass is calculated.
(e) Cation - A positively charged ion is called a cation it is formed by loss of electrons from atom. For example Na^+.

24] Work is said to be done when some force is applied on a body and the body moves through some distance in the direction of force. Its SI unit is joule (J).

The capacity of doing work (or total work done) by a man or an agent, is called the energy of the man or the agent. Its SI unit is joule (J).

Rate of doing work by a man or machine is called power of the man or the machine. Its SI unit is watt (W).

$$\text{Power} = \frac{w}{t} = \frac{Nmgh}{t} = \frac{30 \times 80 \times 10 \times 0.125}{30} = 100\,\text{watt}$$

OR

Kinetic energy is the energy possessed by a body due to its motion.

Potential energy is the energy possessed by a body due to its position or configuration.

Expression for kinetic energy: $KE = \frac{1}{2}mv^2$

$$KE = \frac{1}{2}mv^2 = \frac{1}{2} \times 10 \times (10)^2 = 500\,J$$

25] We know that many human activities lead to increase in the levels of pollution of the air, water bodies and soil. Isolating such activities to specific and limited areas is an impossible task. As air, water and soil are naturally inter - related resources. They do not remain confined to specific areas after pollution. We have to understand that the effects of pollution are long lasting and ironically the impact of damage is never felt by the person who pollutes these resources.

Air pollution brings about global environmental changes such as,

(1) Acid rainfalls;

(2) Global warming due to increase in the concentration of green house gases (CO_2, CH_4 and CFCs) in the atmosphere ;

(3) Depletion of ozone layer.

Water Pollution in the same way has a huge impact on our and our neighbours lives. Water moves in streams, rivers and oceans and distributes wastes to far - off places from the point of contamination.

Similarly, underground - water pollution due to sewage, industrial wastes and agricultural percolation will affect large areas.

The only way to reduce pollution is to have - knowledge, consideration and preparation for pollution control. It doesn't take much effort - just a little thought to add our bit of contribution to reduce pollution.

OR

Carbon cycle: There are four ways by which carbon dioxide is returned in the atmosphere:
(a) Respiration of plants and animals.
(b) Burning of fossil fuels and volcanic eruptions.
(c) Decomposition of dead organic matter.
(d) Action of acid rain on carbonate rock and inorganic carbonate shells.

26] Pinus

27] (i) protista (ii) fungi
(iii) pteridophyta (iv) thallophyta

28] Warm blooded

29] head, thorax and abdomen

30] soil rich in humus

31] Angiosperms

32] Range 0 - 250 gwt ; Least count 1 gwt

33] A

34] A polished metallic sheet

35] 2 mL

36] 0.5 N

37] Equal in all

38] Have multiple reflections and prevent spreading of sound

39] C

40] C

41] 3200 Nm^{-2}, 8000 Nm^{-2}