

DAV PUBLIC SCHOOLS, ODISHA ZONE -1
ANNUAL EXAMINATION (2019-20)

- Check the question paper contains **8** printed pages.
- Check that this question paper contains **30** questions
- Write Serial Number of the question before attempting it.
- **15** minutes cooling time has been allotted to read the question paper only and do not write any answer on the answer book during this period.

CLASS--IX
SUB: SCIENCE (Theory)

Time: 3 Hours

Maximum Marks: 80

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. Identify the type of colloid if the dispersed phase is liquid and dispersing medium is solid. 1
2. The smell of hot sizzling food reaches you several meters away, but to get the smell from cold food you have to go close. Select a particular term to justify it. 1
3. **Answer question numbers 3(a) - 3(d) on the basis of your understanding of the following paragraph and the related studied concepts**

Ultrasound refers to a sound wave with a frequency greater than the upper limit of human hearing. Ultrasound is used in many different fields. Ultrasonic devices are used to detect objects and measure distances. Ultrasound imaging or ultrasonography is often used in medicine. Ultrasound images may not be as adversely affected by metallic objects, as opposed to CT or MRI. Ultrasound is used to detect invisible flaws. Industrially, ultrasound is used for cleaning, mixing, and accelerating chemical processes. Bats emit ultrasound from their mouths and receive its echo. From the

time interval between sending the sound and receiving the echo as well as the angle of the echo received, they can determine the distance to targets and their location. Similarly dolphins use ultrasound to capture the surrounding conditions and communicate with their peers. Ultrasound travels through various media including gases, liquids and solids but cannot travel through vacuum. Ultrasound travels in a very straight line. An ultrasonic wave is reflected when it strikes an interface between materials, with different speeds of sound.

3a) Write any two factors that help a bat to locate its prey.

3b) Give two applications of ultrasound in the field of industry.

3c) Write one advantage of ultrasound over CT or MRI.

3d) The speed of sound in air is 344m/s. Write the speed of ultrasound in air.

4. **Answer question numbers 4(a)—4(d) on the basis of your understanding of the following paragraph and the related studied concepts.**

In simplest terms, "greenhouse gases" let sunlight through to the earth's surface while trapping "outbound" radiation. This alters the radiative balance of the earth and results in warming of the earth's surface. The major greenhouse gases are water vapour, carbon dioxide (CO_2), methane (CH_4), chlorofluorocarbons (CFCs) and hydrogenated chlorofluorocarbons (HCFCs), tropospheric ozone (O_3) and nitrous oxide (N_2O). These gases or molecules are naturally present in the atmosphere of the Earth. However, they are also released due to human activities. These gases play a vital role in trapping the heat of the Sun and thereby gradually warming the temperature of Earth. The trapping and emission of radiation by the greenhouse gases present in the atmosphere is known as the Greenhouse effect. Without this process, Earth will either be very cold or very hot, which will make life impossible on Earth. The greenhouse effect is a natural phenomenon. When people burn fossil fuels like coal, oil and natural gas, this adds carbon dioxide into the air. This is because fossil fuels contain lots of carbon and burning means joining most of the atoms in the fuel with oxygen. Due to wrong human activities such as clearing forests, burning fossil fuels, releasing industrial gas in the atmosphere, etc., the emission of greenhouse gases is increasing. Thus, this has, in turn, resulted in global warming.

4.(a) Mention two activities which lead to global warming **1**

4.(b) How do the greenhouse gases keep the earth warm? **1**

4.(c) Name the phenomenon responsible for which life is sustained on the earth. **1**

4.(d) Define global warming. **1**

5. Two pieces of metal when immersed in a liquid have equal upthrust on them, then 1
- a) Both pieces must have equal weights.
 - b) Both pieces must have equal volume.
 - c) Both pieces must have equal densities.
 - d) Both pieces must float at same depths.

OR

Water meniscus in a graduated cylinder is of concave shape. While finding the volume, the correct reading will correspond to

- a) upper end of meniscus
 - b) lower end of meniscus
 - c) the mid point of meniscus
 - d) anywhere on the meniscus
6. The S.I. unit of G is 1
- a) Nm^2/kg^2
 - b) Nkg^2/m^2
 - c) $N kg/s^2$
 - d) Ns/kg^2

7. A passenger in a moving train tosses a coin which falls behind him. It means that motion of the train is 1
- (a) accelerated (b) uniform (c) retarded (d) along circular tracks
8. The sugarcane plant continues to grow in length even after its tip is removed. Which part of the plant is responsible for this? 1
- a) Cambium (b) Apical meristem (c) Lateral meristem (d) Intercalary meristem

OR

Plant cells with thickened at corners, non-lignified cell walls

- a) parenchyma (b) collenchyma (c) sclerenchyma (d) epidermal cell
9. Molecules of proteins contain 1
- a) Carbon (b) Oxygen (c) Nitrogen (d) All of these
10. Gopal was asked to prepare three mixtures in three different beakers A, B and C. After preparing the mixture, it was observed that mixture in beaker A was transparent, mixture in beaker B was opaque and beaker C was carrying a translucent mixture. The nature of mixture in different beakers are 1
- a) Suspension, colloid and true solution.
 - b) True solution, suspension and colloid.
 - c) Suspension, true solution and colloid.
 - d) True solution, colloid and suspension .

OR

When a mixture of iron filling and sulphur powder is heated, it is seen that

- a) Sulphur does not melt first.
- b) Iron sulphide is formed after sometime.
- c) both iron fillings and sulphur powder melt together.
- d) iron fillings start melting first.

11. Nitrogen fixation can be done by

- a) Industries
- b) Lightening
- c) Rhizobium
- d) All of these

12. Which of the following does not belong to a marine variety?

- a) Grass Carp
- b) Pomphret
- c) Mackerel
- d) Bombay Duck

ASSERTION AND REASONING

(a) Both the assertion (A) and reason (R) are correct and reason (R) is the correct explanation of assertion (A).

(b) Both the assertion (A) and reason (R) are correct but reason (R) is not the correct explanation of assertion (A).

(c) Assertion (A) is true but reason (R) is false.

(d) The statement of assertion (A) is false but reason (R) is true.

13. (A) The formula of an ionic compound is X_2Y .

(R) As a monovalent metal (X) combines with a divalent nonmetal (Y), the compound X_2Y is formed.

14. (A) Forces of action and reaction are equal in magnitude but opposite in direction, yet the acceleration produced by them may not be equal.

(R) Forces of action and reaction act on two different bodies.

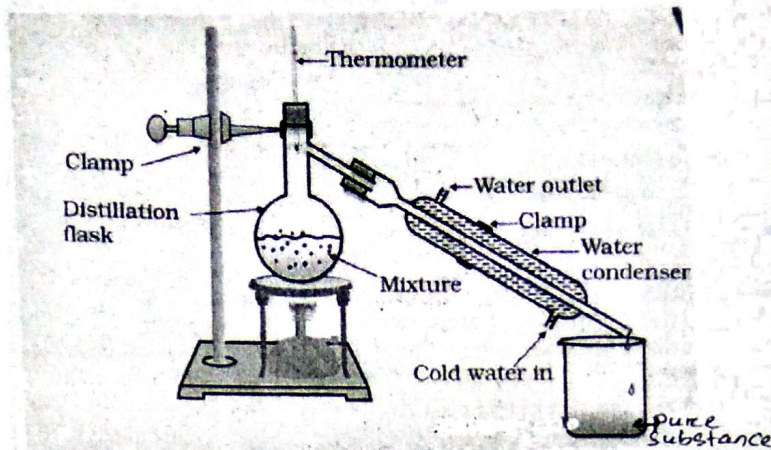
SECTION-B

15. a. Define saturated solution.

b. Calculate the mass of glucose and mass of water required to make 250g of 25% solution of glucose.

OR

A separation technique is given below in the diagram.



- a) Name the technique or method used in the above diagram.
- b) Applying the above technique suggest an example of a mixture that can be separated.
- c) Write the principle involved in the above method.
16. (a) Define Latent heat of fusion. Write its unit. 3
- (b) Name the process involved when naphthalene ball disappears without leaving any residue.
- (c) Write the value of boiling point of water and melting point of ice in Kelvin scale.
17. (a) Draw a Bohr orbit diagram for an atom which contains three electrons in the outermost shell, if the outermost shell is M shell. 3
- (b) The average atomic mass of a sample of an element X is 16.2 u. Predict the percentage of isotopes 1_8X and ${}^{18}_8X$ in the sample.
18. Parenchyma and Sclerenchyma are types of simple permanent tissues present in the plants. Differentiate between these tissues on the basis of cell wall, function with the help of suitable diagrams. 3
19. Analyse the given statements and justify them giving valid reasons: 3
- a) The cell becomes plasmolysed when kept in hypertonic solution.
- b) Mitochondria are able to make their own proteins.
- c) Endoplasmic Reticulum helps in membrane biogenesis.
20. Classify the nutrients provided by soil to plants and give their importance with two examples of each. 3

OR

Name and explain any three factors for which the crop variety improvement programmes are carried out.

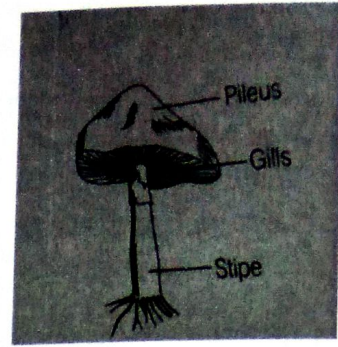
21. Observe the figures A, B, C given below



A



B

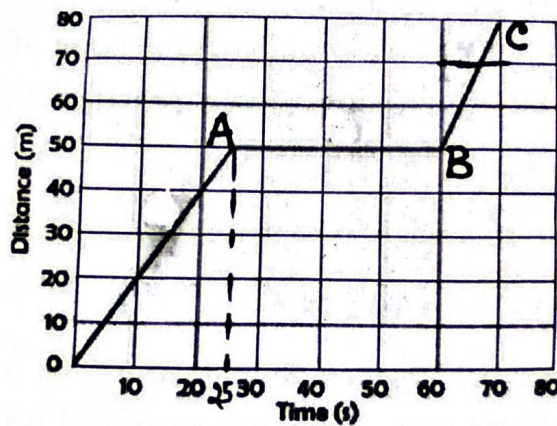


C

Identify and write the scientific name of the organism and also mention the kingdom/phylum/division they are classified into.

22. Observe the d-t graph of a body given below.

- Compare the speeds of the object in OA and BC. Show with suitable calculation.
- Construct the corresponding v-t graph for the same on your answer sheet.



23. A ball was thrown vertically upwards which returned to the thrower after 8 s. Find

- the velocity with which it was thrown
- the maximum height it reached
- its position after 5s. (take $g=9.8\text{m/s}^2$)

OR

A block of wood of dimensions $30\text{cm} \times 15\text{cm} \times 10\text{cm}$ and mass 400g is kept on a horizontal table.

- Find the maximum and minimum pressure exerted by the object on the table if kept with surfaces having different dimensions in S.I. unit. (take $g=10\text{m/s}^2$)
- Also find the ratio of the minimum and maximum pressure thus obtained.

24. a) State Newton's second law of motion.

3

b) It is difficult for a fireman to hold a hose-pipe, which ejects large amounts of water at a high velocity. Give reason

SECTION-C

25.(a) Show the formula of Sodium carbonate using criss cross method.

5

(b) Choose the cation and anion present in CH_3COONa .

(c) Write the difference between O_2 and 2O .

(d) Calculate the number of atoms of Helium in

i) 52g of Helium.

ii) 52u of Helium

OR

(a) Write the postulate of Dalton's atomic theory which cannot explain about isotopes.

(b) Nitrogen and hydrogen combines in the ratio of 14:3 by mass to form 17g of ammonia. Calculate the quantity of ammonia formed when 14g of nitrogen reacts with 6g of hydrogen.

(c) Use a particular term to express the mass of a compound whose constituent particles are ions. Explain by using a suitable example.

26.(a) Find the number of electrons, protons and neutrons & mass number in 'M' if M^{3+} ion contains 10 electrons and 14 neutrons.

5

(b) Describe Thomson's model of an atom with a labelled diagram.

(c) Discuss the reason for which the electronic configuration of potassium is 2,8,8,1 instead of 2,8,9.

(d) Relate the observation of the Rutherford α -ray scattering experiment which concludes that most of the space in the atom is empty.

27. (a) Define the S.I. unit of power.

5

(b) Write the mathematical relation between energy, power and time.

(c) An engine can pump 30,000 litres of water to a vertical height of 45m in 10min. Calculate the work done by the machine and the power of the machine. [$g=10 \text{ m/s}^2$, Density of water = 10^3 kg/m^3 , $1000 \text{ litre} = 1 \text{ m}^3$]

OR

(a) Define the S.I. unit of work.

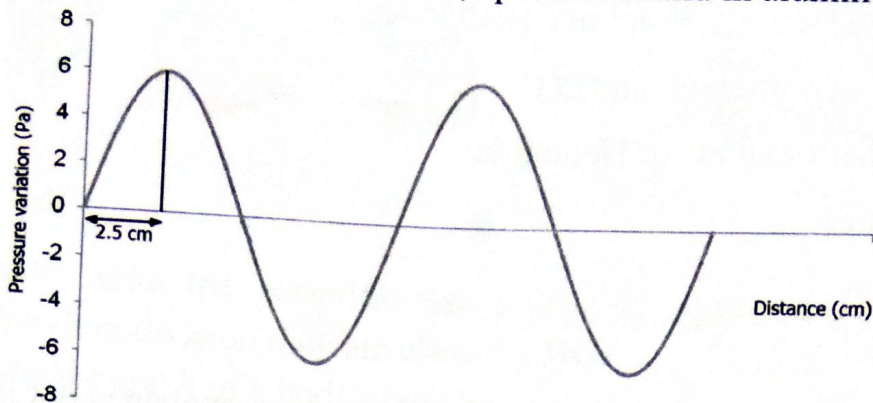
(b) Write the mathematical relation between commercial unit of energy and joule.

(c) The speed of a car is increased from 36 km/h to 72 km/h by the application of a force of 375N on it. Calculate the work done by the force on the car if the mass of the car is 500 kg. Also find the displacement of the car.

28. a) Two children are at opposite ends of an aluminum rod of length 172m. One strikes the end of the rod with a stone. The second child says that he hears the sound two times. Justify his statement. Find the time interval between these two sounds heard by him.

(Given speed of sound in air= 344m/s, speed of sound in aluminum rod=6192m/s)

b)



The pressure-distance graph of a sound wave is given above. From the above graph, find

i) the wavelength of the wave.

ii) velocity of the wave if the time period of the wave is 4×10^{-3} s.

29. (a) Name the causative organism of Kala-azar and classify the type of infectious agent.

(b) Suggest two measures that should be taken by the local authorities of your neighborhood to bring down the incidence of disease like malaria, typhoid and dengue.

(c) Identify the communicable diseases from the following
Malaria, diabetes, hypertension, AIDS, cholera, dengue.

30. a) Give reasons for the following:

i) *Nereis* belongs to the phylum Annelida.

ii) Bryophytes are called amphibians of the plant kingdom.

iii) Platypus and Echidna lay eggs but they are classified under mammals.

b) Differentiate between cryptogams and phanerogams by giving examples of each.

OR

a) Name and draw a filamentous alga and label any two parts of it.

b) Explain any two distinguishing features of the phylum that consists of parasitic worms only.