SCIENCE

IX (CBSE) **Full Syllabus Test** **Full Marks: 80**

Time: 3 hrs.

(All questions are compulsory)

PHYSICS

1. (a) A 300 m long train crosses a 1200 m long bridge with a uniform speed of 54 km/h. Calculate the time taken by the train to cross the bridge. [2]
   (b) Differentiate between speed and velocity. [2]
   (c) (i) What does the slope of a displacement-time graph represent ?
   (ii) What does the slope of the velocity-time graph represents ?
   (iii) What does the area enclosed by the speed-time graph and the time axis represents.
   (iv) What do you mean by uniform circular motion ? [1+1+1+1]
   (d) An athlete completes one round of a circular track of diameter 40 m in 12s. What will be the distance covered and displacement at the end of 54s ? [2]

OR,

   (a) Differentiate between a Musical sound and Noise. [2]
   (b) Which wave property determines (i) loudness, (ii) pitch ? [2]
   (c) (i) What do you mean by supersonic speed ?
   (ii) A tuning fork has a number 512 marked on it. What does it mean ?
   (iii) Name two devices which work on the reflection of sound.
   (iv) What is persistence of hearing ? [1+1+1+1=4]
   (d) A body is vibrating 6000 times in 1 minute. If the velocity of sound in air is 360 m/s, find (i) Frequency and (ii) wavelength of sound. [2]

2. (a) Calculate the work done to stop a car of 1500 kg moving at a velocity of 60 km/hr. [2]
   (b) (i) Define 1J of work.
   (ii) Define 1 watt of power.
   (iii) 1 kwh = _____ J.
   (iv) A battery lights a bulb. Write the energy changes involved in the process. [1+1+1+1]
   (c) (i) What is meant by the statement relative density of gold is 19.3 ?
   (ii) Define buoyancy ?
   (iii) Why does ice floats in water ?
   (iv) Why it is easier to swim in sea water than in river water ? [1+1+1+1]

3. (a) A bus of mass 400 kg moving at 72 km/hr is brought to rest after it covered a distance of 20 m. Find the retarding force acting on the bus. [3]
   (b) A shell of mass 1.5 kg is horizontally fired with a velocity 200 m/s from a cannon of mass 50 Kg. What is the recoil velocity of the cannon? [2]
   (c) An object of mass 200 kg is accelerated uniformly from velocity of 10 m/s to 15 m/s in 5s. Calculate initial and final momentum. Hence calculate the force exerted on the object. [2]

CHEMISTRY

4. A solution contains 40 g of common salt in 320 g of water. What is the concentration in terms of mass by mass percentage of solvent? [2]

OR,

What is the mass of sodium sulphate required to prepare its 20% (mass per cent) solution in 100 g of water? [2]

5. Zinc sulphate contains 22.65% of zinc and 43.9% of water of crystallisation. If the law of constant proportion is true, then the weight of zinc required to produce 20 g of the crystals? [2]

6. Which substance cannot be broken down by a chemical reaction? [1]
   Ammonia or Argon

OR,

The atoms of which of the following pair of elements are most likely to exist in free state? [1]
H and He or He and Ne

7. 22 g of carbon dioxide convert into mole. Calculate. [1]
8. What is the electronic configuration of Na? [1]
9. **Assertion:** Atomic mass of aluminium is 27. [1]

Reason: An atom of aluminium is 27 times heavier that $\frac{1}{12}$th of the mass of carbon-12 atom.

(a) Both assertion and reason are true and reason is correct explanation of the assertion.
(b) Both assertion and reason are true and reason is not the correct explanation of the assertion.
(c) Assertion is true but reason is false.
(d) Assertion is false but reason is true.

10. Read the following and answer the questions. [5]

A homogenous mixture of two or more substances is called a true solution. It consists of solute and solvent. The particle size of a true solution is less than 1 nm. A suspension is a heterogeneous mixture in which the solute particles do not dissolve but remain suspended throughout the bulk of the medium. A colloid is a mixture that is actually heterogeneous but appears to be homogeneous as the particles are uniformly spread throughout the solution.

(i) Which one of the following is the most stable?
  (a) True solution
  (b) Suspensions
  (c) Colloid
  (d) Both (a) and (b)

(ii) Which type of mixture can be separated by filtration?
  (a) Colloid
  (b) True solution
  (c) Suspension
  (d) All of these

(iii) Which statement is incorrect about Tyndall effect?
  (a) Size of particles causes Tyndall effect
  (b) If particles are very tiny there is no Tyndall effect.
  (c) True solutions show Tyndall effect
  (d) All of the above

(iv) Which is the correct order of stability of solution?
  (a) True < colloid < suspension
  (b) Suspension < true < colloid
  (c) True < suspension < colloid
  (d) Suspension < colloid < true

(v) Choose the correct match.

Solutions	Examples
A. Colloid	1. Sugar solution
B. Suspension	2. Milk
C. True solution	3. Chalk in water

Codes:
(a) A – 2; B – 3; C – 1
(b) A – 3; B – 1; C – 2
(c) A – 1; B – 2; C – 3
(d) A – 3; B – 2; C – 1

11. A gas jar contains 1.7 g of ammonia gas. Calculate the following. [3]
    (i) Molar mass of NH_3 (ammonia).
    (ii) How many moles of ammonia are present in the gas jar?
    (iii) How many molecules of ammonia are present in the sample?
12. (i) Distinguish among the true solution, suspension and colloid in a tabular form under the following heads: [3]
    (a) Stability
    (b) Filterability
    (c) Type of mixture
    (ii) Give expression for the concentration of a solution. How will you prepare a 10% solution of glucose by mass in water? [2]

    OR,

    While diluting a solution of salt in water, a student by mistake added acetone (boiling point 56°C). What technique can be employed to get back the acetone? After separating acetone, how can the salt be recovered from its solution? [5]
13. An element $^{14}_{7}A$ exists as diatomic gas in nature which is relatively inert and forms 78% of earth's atmosphere.
    (i) Identify the gas and write its molecular formula. Write the formulae of nitrite and nitrate ions. [5]
    (ii) How many moles of this gas would contain 12.044×10^{23} atoms of this element? (Avogadro's number = 6.022×10^{23})
    (iii) Calculate the molecular mass of the following
    (a) NH_4NO_3
    (b) HNO_3
    (Given, atomic masses N = 14 u, O = 16 u, H = 1 u)

BIOLOGY

14. Define hybridisation. [1]
15. Define weeds. [1]
16. How do insects damage crop plants? [1]
17. I am a cell. I belong to a tissue which is red in colour. I flow with a fluid. I am colourless. I am eukaryote and have a centrally placed nucleus and also I am granular. My count is the least in my category. I secrete a chemical which inhibits clotting of blood in the body. Who am I? [1]
18. Which nutrients are supplied to plants by air, water and soil? [2]
19. State one function of SER. [1]
20. State two functions of adipose tissue. [2]
21. Write the advantages of composite fish culture. How are fishes obtained? [2]
22. Name one eukaryotic cell in human body which can not divide. [2]
23. Write four differences between axon and dendron. What is Pasturage? [2+1]
24. Draw a plant cell and label two parts; one which helps in cellular packaging and one which produces proteins. [3]
25. Write three differences between Prokaryotic cell and Eukaryotic cell. [3]
26. **Carry out the following osmosis experiment:**
    Take four peeled potato halves and scoops each one out to make potato cups. One of these potato cups should be made from a boiled potato. Put each potato cup in a trough containing water. Now, [2 + 1 + 2]
    (a) Keep cup A empty
    (b) Put one teaspoon sugar in cup B
    (c) Put one teaspoon salt in cup C
    (d) Put one teaspoon sugar in the boiled potato cup D.
    Keeps these for two hours. Then observe the four potato cups and answer the following:
    (i) Explain why water gathers in the hallowed portion of B and C.
    (ii) Why is potato A necessary for this experiment?
    (iii) Explain why water does not gather in the hollowed out portions of A and D.