SUMMATIVE ASSESSMENT – II, 2012
SCIENCE
Class – IX

Maximum Marks : 90

Time allowed : 3 hours

General Instructions :
(i) The question paper comprises of two Sections, A and B. You are to attempt both the
sections.
(ii) All questions are compulsory.
(iii) There is no overall choice. However, internal choice has been provided in all the five
questions of five marks category. Only one option in such questions is to be attempted.
(iv) All questions of Section-A and all questions of Section-B are to be attempted separately.
(v) Question numbers 1 to 3 in Section-A are one mark questions. These are to be answered in
one word or in one sentence.
(vi) Question numbers 4 to 7 in Section-A are two marks questions. These are to be answered in
about 30 words each.
(vii) Question numbers 8 to 19 in Section-A are three marks questions. These are to be answered
in about 50 words each.
(viii) Question numbers 20 to 24 in Section-A are five marks questions. These are to be answered
in about 70 words each.
(ix) Question numbers 25 to 42 in Section-B are multiple choice questions based on practical
skills. Each question is a one mark question. You are to select one most appropriate
response out of the four provided to you.

SECTION-A

1. Give an example of (i) triatomic (ii) Polyatomic molecule of elements.

2. In which kingdom would you place an organism which is single celled, eukaryotic
and photosynthetic?

3. List two activities of man which lead to environmental pollution.

4. List two distinguishing features between Annelid animals and Arthropods.

5. Health workers are exposed to more sick people than others in the community. Write
any four preventive measures they take to avoid sickness.

6. Give reason for the following
   (i) Cutting and piercing tools are made sharp.
   (ii) An egg sinks in fresh water but floats in highly salty water.

7. When is work said to be done against the force of gravity? State and define SI unit of
work.

8. An element ‘X’ forms an oxide with formula X₂O₃
   (i) State the valency of ‘X’.
   (ii) Write the formula of (a) chloride of X, (b) Sulphate of X.

9. State the observations in α-particle scattering experiment which led Rutherford to
make the following conclusions:
   (i) Most of the space in an atom is empty.
   (ii) Whole mass of an atom is concentrated in its centre.
   (iii) Centre is positively charged.
10. (i) State the limitations of J.J. Thomson's model of an atom.
(ii) Define valency by taking the examples of magnesium (At. No 12) and oxygen (At. No 8).
(iii) S has completely filled K, L and M shells. Find its atomic number.

11. State the appropriate term for the following:
(i) Plants which bear seeds with two cotyledons.
(ii) Animals which do not have coelom.
(iii) Edible fungi.

12. State the type of cells Monera have. Explain their structure and the types of nutrition they have.

13. Some drug does not work against the microbes belonging to different groups. Why?

14. What is meant by buoyancy? Why does an object float or sink when placed on the surface of a liquid?

15. The kinetic energy of an object moving with a velocity of 5 m/s is 25J. Find the mass of the object. What will be its kinetic energy when its velocity is made
(i) two times
(ii) three times? Justify your answers.

16. Define commercial unit of energy. Derive relationship between this unit of energy and SI unit of energy. An electrical device of 500 W is used daily in a household for 10 hours. Calculate the energy consumed in the month of April.

17. What is a SONAR? For what it is used? Explain in brief its working.

18. How is soil formed? List four factors which play a vital role in the formation of soil.

19. Our Earth is covered with approximately 75% water still there is an urgent need to conserve water. Why?

20. (a) Explain with the help of a labelled diagram any activity for the verification of law of conservation of mass.
(b) Find the number of atoms present in 100g of sodium and 100g of iron.
   (Given that Na = 23 u; Fe = 56 u; N = 6.022 x 10^23 per mole)

OR

(a) Define atomic mass unit.
(b) List the elements present in each of the following compounds:
   (i) Quick lime
   (ii) Sodium bicarbonate
(c) Find the number of particles in each of the following:
   (i) 0.1 mole of C atoms
   (ii) 46 g of Na atoms
   (Given that Na = 23 u; N = 6.022 x 10^23 per mole)

21. (a) List two distinguishing features between Porifera and Coelenterate animals.
(b) Give reasons to justify the following statements:
   (i) Platypus and echidna lay eggs but are considered as mammals.
   (ii) Crocodiles have four chambered heart but are still reptiles.
   (iii) Forelimbs of birds are modified.

OR

(a) List two distinguishing features between amphibians and reptiles.
(b) State appropriate terms for the following:
   (i) Animals that are not able to maintain their normal body temperature over a wide range of temperature in the environment.
   (ii) Plants which have naked seeds.
   (iii) Animals which have pseudocoelom.
22. What is meant by power of a machine? Name and define its SI unit. How is kilowatt different from kilowatt hour?
   From a 20 m high fall nearly 25 metric tonnes of water fall per second. Calculate the equivalent power if all this energy is utilized. \( g = 10 \text{ m/s}^2 \)

   OR
   (a) Define potential energy. Derive an expression for the gravitational potential energy of a body of mass \( m \) raised to a height \( h \) above the ground.
   (b) State the energy transformation in the following:
       (i) heat engine
       (ii) electric motor

23. Draw labelled diagram of auditory parts of human ear and explain how the human ear works.

   OR
   Define the following terms and state their SI units:
   (i) Wave length
   (ii) Time period
   (iii) Amplitude
   Establish the relation \( v = \lambda \) where symbols have their usual meanings.

24. (a) Draw a labelled diagram to show nitrogen cycle in nature.
   (b) “Water is essential for living organisms”. State two reasons to justify this statement.

   OR
   (a) Draw a labelled diagram to show oxygen cycle in nature.
   (b) List any two uses of carbon in living organisms.

SECTION - B

25. For the verification of the law of conservation of mass in a chemical reaction, four students A, B, C and D performed the following reactions.
   A : Added lime stone to dil. hydrochloric acid.
   B : Heated lead nitrate (Solid) in a test tube.
   C : Dipped Mg ribbon in Copper sulphate solution.
   D : Added copper sulphate solution to sodium carbonate solution.

   The student who is likely to obtain the best result is
   (a) A (b) B (c) C (d) D

26. A reaction between barium chloride and sodium sulphate was carried out in a sealed conical flask. The masses of the reactants and the products were measured carefully.

   After the experiment it was concluded that
   (a) Mass of barium chloride = Mass of sodium chloride
   (b) Mass of sodium sulphate = Mass of barium sulphate
   (c) Mass of \( \text{(barium chloride} + \text{Sodium sulphate}) \) = Mass of \( \text{(barium Sulphate} + \text{Sodium Chloride}) \)
   (d) Mass of \( \text{(barium Chloride} + \text{sodium chloride}) \) = Mass of \( \text{(barium sulphate} + \text{sodium sulphate}) \)

27. An animal covered by chitin covering having wings, antennal and jointed legs is
   (a) Cockroach (b) Flat worm (c) Leech (d) Nereis
28. Chloroplast present in Spirogyra are
(a) book shaped (b) irregular in shape
(c) ribbon shaped (d) spiral shaped

29. The correct labelling of parts A, B, C, and D is

(a) A-Mouth B-Eye C-Fin D-Scale (b) A-Eye B-Mouth C-Fin D-Scale
(c) A-Mouth B-Scale C-Eye D-Fin (d) A-Fin B-Eye C-Scale D-Mouth

30. In pine leaves are
(a) Needle like (b) Scale like (c) Flat (d) Broad shaped

31. Four students A, B, C, and D observed the seeds and flowers of a pea plant. They reported that the seeds and flowers of pea plant are:
(a) monocotyledonous seeds and pentameric flowers.
(b) monocotyledonous seeds and trimerous flowers.
(c) dicotyledonous seeds and pentameric flowers.
(d) dicotyledonous seeds and trimerous flowers.

32. A student is observing the developmental stages in the life cycle of mosquito. He observes that the stage in which the organism appears like a worm is:
(a) egg (b) larva (c) pupa (d) adult.

33. The correct way of reading the liquid level in a measuring cylinder is shown in figure:

(a) A (b) B (c) C (d) D

34. A student using spring balance records the weight of a iron cube in air, in tap water and in concentrated solution of common salt in water. If his three readings taken in this order are \( W_1 \), \( W_2 \) and \( W_3 \), he is likely to observe that
(a) \( W_1 > W_2 > W_3 \) (b) \( W_1 > W_2 = W_3 \)
(c) \( W_1 > W_3 > W_2 \) (d) \( W_1 = W_2 < W_3 \)
35. Four measuring cylinders with different least counts are shown in fig. A, B, C, and D.

The most suitable cylinder for determining the volume of a cube of side nearly 1 cm is
(a) A  (b) B  (c) C  (d) D

36. Three students A, B and C determined the volume of a solid by immersing it in water in the overflow cans setup as shown. The result obtained will not be correct for

(a) Student A  (b) Student B  (c) Student C  (d) All three students

37. A student is doing an experiment to find the pressure exerted by an iron cuboid of dimension 2 cm x 5 cm x 15 cm on loose sand. He will observe that it exerts minimum pressure when it is placed on the sand with its side of dimensions

(a) 2 cm x 5 cm  (b) 2 cm x 15 cm  (c) 5 cm x 15 cm  (d) 5 cm x 2 cm

38. A metallic cuboid of mass 7.5 kg and dimensions 5 cm x 10 cm x 20 cm is placed on a table to exert pressure on its surface. If g = 10 m/s², the maximum pressure which can be achieved by the cuboid is

(a) 3750 Pa  (b) 5000 Pa  (c) 7500 Pa  (d) 15000 Pa
39. Along which of the following four directions OA, OB, OC and OD a narrow tube be placed so that the ticking of a clock placed at P is heard the loudest after being reflected from the reflecting surface.

(a) OA  (b) OB  (c) OC  (d) OD

40. Suppose you have following material available in your school laboratory:
(A) An intense pointed source of sound
(B) An intense and broad source of sound
(C) A sharp pointed sound detector
(D) A well polished metallic sheet
(E) Two thin hollow card board tubes
(F) A thick thermocol sheet
You can perform the experiment on verifying the laws of reflection of sound successfully without using:
(a) A and F  (b) B and D  (c) B and E  (d) only B

41. While doing the experiment on measuring the velocity of a pulse through a stretched string a student had to choose from the following:
(A) Thick silk string  (B) Thick woollen string
(C) Stop watch  (D) Table clock
(E) 8m long thick cotton string  (F) 2m long thin cotton string
For Test result the proper choice of the combination is:
(a) A, C, E  (b) C, E  (c) B, D, F  (d) B, D

42. A longitudinal pulse was created in a slinky of length 6m by a group of four students A, B, C and D. They observed that the pulse completed its four to and fro journeys in 10s. On the basis of this data the speed of pulse in the slinky is
(a) 4.8 m/s  (b) 6.4 m/s  (c) 7.2 m/s  (d) 9.6 m/s