BK BIRLA CENTRE FOR EDUCATION

SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL

MID-TERM EXAMINATION 2023-24

SCIENCE (086)

Class : IX
Date :11.10.23
Admission No.:

Duration : 3 Hrs
Max. Marks : **80**
Roll No.:

General Instructions:

(i) This question paper consists of 39 questions. All questions are compulsory.
(ii) Question paper is divided into five sections viz. A, B, C, D and E.
(iii) Section A – question numbers 1-16 are multiple choice questions and 17-20 are assertion & reason, carrying 1 mark each.
(iv) Section B – question numbers 21-26 are Very short Answer type questions carrying 2 mark each. Answers to these questions should be in the range of 30 to 50 words.
(v) Section C – question numbers 26-33 are short Answer type questions carrying 3 mark each. Answers to these questions should be in the range of 50 to 80 words.
(vi) Section D – question numbers 34-36 are Long Answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120 words.
(vii) Section E – question numbers 37-39 are 3 Case Based units of assessment having 4 questions carrying 1 or 2 mark each.
(viii) There is no overall choice. However, an internal choice has been provided in some questions. A student is expected to attempt only one of these questions.

Section–A

(*Select and write one most appropriate option out of the four options given for each of the questions 1-20 of 1 mark each)*

1. What is the quantity which is measured by the area occupied below the velocity-time graph? 1
   (a) Displacement (b) speed (c) Acceleration (d) None of these
2. Some of the leaves may get detached from a tree if we vigorously shake its branch due to? 1
   (a) Velocity is large (b) Inertia of rest (c) Velocity is less (d) None of these
3. Non uniform compositions of solutions called_____ solutions. 1
   (a) Mixture (b) Texture (c) Homogenous (d) Heterogeneous
4. Mixture of two or more metals , or metals and non-metals called as_____. 1
   (a) Alloy (b) Solution (c) Mixture (d) Metallic mixture
5. Brass is mixture of_____ and_____. 1
   (a) Zinc, carbon (b) Zinc, Mg (c) Zinc, Co (d) Zinc, Copper
6. A component present in lesser quantity in solution called_____. 1
   (a) Solute (b) Sugar (c) Solvent (d) Mixture
7. Which of the following is most suitable for summer? 1
   (a) Cotton (b) Nylon (c) Polyester (d) Silk.
8. Which of the following does not affect rate of evaporation? 1
   (a) Wind speed (b) Surface area (c) Temperature (d) Insoluble heavy impurities
9. Which of the following has highest kinetic energy? 1
   (a) Particles of ice (b) Particles of aluminium
   (c) Particles of water at 100 °C (d) Particles of iron

10. Sieve tubes and companion cells are present in_____. 1
(a) xylem (b) phloem (c) cork (d) cambium

11. The common feature of mitochondria and chloroplasts is _____. 1
(a) Ability to produce ATP (b) Presence of DNA
(c) Presence of stroma (d) Deeply folded inner membrane

12. Cartilage and bone are types of _____. 1
(a)muscular tissue (b)connective tissue (c)meristematic tissue (d)epithelial tissue

13. The tissue that helps in the movement of our body are _____. 1
(a) muscular tissue (b) skeletal tissue (c) nervous tissue (d) all of the above

14. Each cell has certain specific fluid component within it known as _____. 1
(a) Cell body (b) Cytoplasm (c) Cell organelles (d) None of them

15. _____ Is called selectively permeable membrane. 1
(a) Cell envelope (b) Cell cover (c) Cell membrane (d) Cell protector

16. Which of the following cell organelles help in storage, modification, and packaging of Substance produced by the cell? 1
(a) mitochondria (b) nucleus (c) Golgi apparatus (d) chloroplasts

Directions: In each of the following questions 17-20, a statement of Assertion is given, and a corresponding statement of Reason is given just below it. Of the statements, given below, mark the correct answer as:
(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, but reason is true.

17. Assertion: Universal gravitational constant G is a scalar quantity. 1
Reason: The value of G is same throughout the universe.

18. Assertion: A gas can easily be compressed by applying pressure. 1
Reason: Since the inter-particle spaces between gases are very large, they can decrease by applying pressure. 1

19. Assertion : The inner lining of intestine has tall epithelial cells. 1
Reason : Columnar epithelium facilitates absorption and secretion.

20. Assertion : Cell is the fundamental unit of life. 1
Reason : life can exist without cells.

Section–B

(*Q.no.21-26 are very short answer questions of 2 marks each)*

21. Two objects, each of mass 1.5 kg, are moving in the same straight line but in opposite directions. The velocity of each object is 2.5 m s^{-1} before the collision during which they stick together. What will be the velocity of the combined object after collision? 2

22. What happens to the gravitational force between two objects, if
(a) The mass of one object is doubled? 1
(b) The distance between the objects is doubled and tripled? 1

OR

Define the following:
(a) Free fall (b) Acceleration due to gravity 2

23. What is tincture of iodine? Identify the solute and solvent in it. 2

24. Draw a neat labelled diagram of Mitochondria. 2

25. Enlist the characteristics of Sclerenchyma tissue. 2

26. Define : (a) Aerenchyma (b) Chlorenchyma 2

OR

Write location and one function of each of the following: 2

(a) Cardiac muscle tissue

(b) Adipose tissue

Section– C

(*Q.no.27-33 are short answer questions of 3 marks each)*

27. A train starting from rest attains a velocity of 72 km h^{-1} in 5 minutes. Assuming that the acceleration is uniform, find (i) the acceleration and (ii) the distance travelled by the train for attaining this velocity. 3

28. State Newton's third law of motion and give two examples to illustrate the law. 3

29. (a) State Newton's first law of motion. 3

(b) Why do you fall in the forward direction when a moving bus brakes to a stop and fall backwards when it accelerates from rest?

30. Give reasons: 3

(a) A gas fills completely the vessel in which it is kept.

(b) A gas exerts pressure on the walls of the container.

(c) A wooden table should be called a solid.

31. To make a saturated solution, 36 g of sodium chloride is dissolved in 100 g of water at 293 K. Find its concentration at this temperature. 3

OR

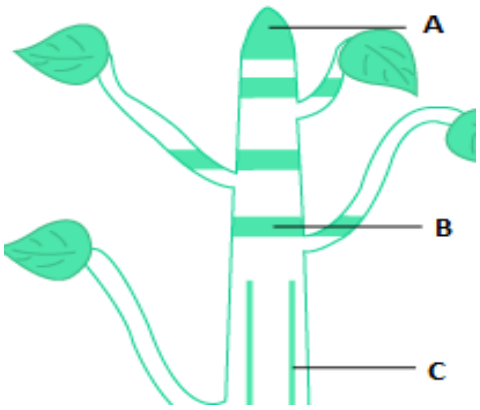
A solution contains 40 g of common salt in 320 g of water. Calculate the concentration in terms of mass by mass percentage of the solution. 3

32. Differentiate between voluntary and involuntary muscles of human body. In which parts they are located? 3

33. Sketch and label structure of Neuron. What are the functions of neuron in human body. 3

OR

In the given figure label the positions of tissues A, B and C . Write one use of each. 3



Section– D

(*Q.no.34-36 are Long answer questions of 5 marks each)*

34. (a) State Newton's law of Gravitation. Calculate mathematical formula of Newton's law of Gravitation. 5

(b) Calculate the SI unit of Universal Gravitational constant

OR

Explain the law of conservation of momentum. Derive mathematical formula of law of conservation of momentum

35. Which separation techniques will you apply for the separation of the following? 5

(a) Sodium chloride from its solution in water.

(b) Ammonium chloride from a mixture containing sodium chloride and ammonium chloride.

(c) Small pieces of metal in the engine oil of a car.

(d) Tea leaves from tea.

(e) Iron pins from sand.

OR

Explain the following giving examples.

(a) Saturated solution

(b Pure substance

(c) Colloid

(d) Suspension

(e) Homogeneous mixture

36. Mention the significances of the following in a cell: 5

(a) Nucleus (b) Lysosomes (c) Vacuole (d) Ribosomes (e). Cell wall

OR

Write differences between a plant cell and animal cell.

Section–E

(*Q.no.37-39 are case based questions of 4 marks each)*

37. To specify the speed of an object, we require only its magnitude. The speed of an object need not be constant. In most cases, objects will be in non-uniform motion. Therefore, we describe the rate of motion of such objects in terms of their average speed.

(a) Under what condition(s) is the magnitude of average velocity of an object equal to its average speed? 1

(b) What is SI unit of speed? 1

(c) Distinguish between speed and velocity. 2

OR

(d) An object travels 18 m in 4 s and then another 12 m in 2 s. What is the average speed of the object?

38. We know that particles of matter are always moving and are never at rest. At a given temperature in any gas, liquid or solid, there are particles with different amounts of kinetic energy. In the case of liquids, a small fraction of particles at the surface, having higher kinetic energy, is able to break away from the forces of attraction of other particles and gets converted into vapour. This phenomenon of change of liquid into vapours at any temperature below its boiling point is called evaporation

(a) Write any two factor which increase the evaporation. 1

(b) Write one difference between evaporation and boiling. 1

(c) How does evaporation cause cooling? 2

OR

How does the water kept in an earthen pot (matka) become cool during summer?

39. Blood is a body fluid in the circulatory system of humans that delivers necessary substances such as nutrients and oxygen to the cells, and transports metabolic waste products away from those same cells Blood protects our body from infections. Blood is circulated around the body through blood vessels by the pumping action of the heart. Blood is composed of blood cells suspended in blood plasma. Plasma, which constitutes 55% of blood fluid, is mostly water, and contains proteins, glucose, mineral ions, hormones, carbon dioxide and blood cells themselves. Albumin is the main protein in plasma. The blood cells are mainly red blood cells , white blood cells and platelets .RBC contain haemoglobin, an iron-containing protein pigment.

(a) How is blood circulated in body? 1

(b) What is Plasma? 1

(c) What is blood composed of? Which is the pigment present in blood? 2

OR

Write 4 functions of blood.

BEST OF LUCK