SET-A

GWPS02A

G - W CLASSES, GONDIA

NEAR GIRI HOSPITAL, VIVEKANAND COLONY GONDIA

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CLASS:IX **SUBJECT: SCIENCE (086)**

MAXIMUM MARKS: 80 **TIME: 3 HOURS**

General Instructions:

A) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry, and Section C is Physics.

B) All sections are compulsory. However internal choice is provided in some questions. A student is expected to attempt only one of these questions.

	SECTION A	
1.	Which of the following cell organelles is responsible for protein synthesis? **C)** Ribosomes B) Lysosomes C) Nucleus D) Vacuole	1
2.	Blood is called a connective tissue because— **A)** It connects body parts **B)** It helps in transportation of materials **C)** It has fluid matrix and connects different organs functionally **D)** It has fibers	1
3.	Cork cells are impervious to gases due to the presence of— **A)** Lignin B) Suberin C) Cutin D) Pectin	1
4.	The main water-conducting elements of xylem are— **A)** Sieve tubes and companion cells **B)** Vessels and tracheids **C)** Parenchyma and sclerenchyma **D)** Collenchyma and xylem fibres	1
5.	Which of the following is a biotic factor affecting crop yield? **A)** Rainfall B) Temperature C) Weeds D) Soil pH	1
6.	Which among the following is an example of green manure? A) Urea B) Guar C) Cow dung D) Compost	1
7.	What is the main objective of animal husbandry? **A)** Increasing human population **B)** Increasing production of animal-based food **C)** Plant breeding D) Forest management	1

8.	Assertion (A): Diffusion and osmosis are similar processes. Reason (R): Both involve movement of molecules from higher to lower concentration. A. Both A and Reason R are true, and R is the correct explanation of A. B. Both A and R are true, but R is not the correct explanation of A. C. A is true, but R is false. D.A is false, but R is true.	1
9.	A. (a) Why is epidermis important for the plants ? (b) Draw a rough diagram of collenchyma tissue and label it properly. OR B. A cell was observed under a microscope and found to have no defined nucleus or membrane-bound organelles. **(i)** Name the type of cell. **(ii)** Give one example of an organism with such cells.	2
10.	What happens when an animal cell and a plant cell are placed in: **(a)** Hypotonic solution. **(b)** B. Hypertonic solution **(c)** C. Isotonic solution	3
11.	Describe the structure of a neuron and state its function. Also draw the diagram.	3
12.	Why is crop variety improvement important in cultivation? Describe the important factors for which variety improvement is done.	3
13.	A banana plant can stand upright even though it has a soft stem. A tree like mango, on the other hand, has a strong woody stem that provides great mechanical support. Both, however, are able to transport water and nutrients efficiently. **A.** Which tissue provides mechanical support to banana stem? **B.** Differentiate between sclerenchyma and parenchyma tissues. Attempt either option C or D. **C.** What is a permanent tissue? Classify permanent tissues OR **D.** Why are xylem and phloem called complex tissues? How are they different from one other ?	4

14.	A. Draw the diagram of animal cell and also State one function of the following cell organelles: i. Nucleus ii. Mitochondria iii. Golgi apparatus iv. Lysosomes v. Endoplasmic reticulum OR 1.List five major differences between prokaryotic and eukaryotic cell. 2.What would happen if the plasma membrane ruptures or breaks down?	5
	SECTION B	
15.	Which of the following is not a property of solids? A. Definite shape B. Incompressibility C. Definite volume D. High rate of diffusion	1
16.	What type of mixture is blood? **A)** True solution B) Suspension C) Colloid D) Compound	1
17.	The molecular mass of CO_2 is: **A)** 22 u B) 28 u C) 44 u D) 32 u	1
18.	The following question 18 consists of two statements -Assertion (A) and Reason (R). Answer this question by selecting the appropriate option given below : **A.** Both A and Reason R are true, and R is the correct explanation of A. **B.** Both A and R are true, but R is not the correct explanation of A. **C.** A is true, but R is false. D.A is false, but R is true. Assertion (A): Electrons revolve around the nucleus in discrete orbits. Reason (R): Electrons lose energy continuously while revolving around the nucleus.	1
19.	State differences between Evaporation and Boiling.	2
20.	Explain with examples. (a) Atomic number (b) Mass number (C)Molecule (D) Polyatomic ion	2
21.	Define latent heat of vaporization . What is the value of latent heat of vaporization for water ? What causes more severe burn water at 100^0 C or steam	2

	at 100^0 C.	
22.	(a) What was Thomson's model of an atom ? (b) Write any two observations of Rutherford's model of atom. OR B. An element 'X' has Mass number 27 and the number of neutrons is 14. i.Find the Atomic number of X. ii.Write the Electronic configuration of X. iii.Identify the element X.	3
23.	Complete the following gaps in the given table and redraw it :	3

Elements	Protons	Electrons	Neutrons	Atomic Number	Mass Number
A	–	–	10	8	–
B	15	–	–	–	31
C	1	–	–	–	3
D	–	11	12	–	–

24.	A water bottle wrapped in a wet cloth is kept under a moving fan. After some time, the water inside the bottle becomes cool. The process involved here is similar to that which helps in cooling earthen pots and desert coolers. **A.** Sea water can be classified as homogeneous as well as heterogeneous mixture.' Comment? **B.** Why does a cooler not work effectively on humid days? **Attempt either option C or D.** **C.** Differentiate between Evaporation and Boiling. OR **D.** State characteristics of particles of matter.	4
25.	Attempt either option A or B. **A.** State any five postulates of Dalton's atomic theory. **B.** Calculate the molar mass of the following substances: (Atomic mass of phosphorus =31u,S=32u, H=1u, Cl =35.5 u, p=31 u, c=12 u ,N= 14 u) (a) Ethyne, C_2H_2 (b) Sulphur molecule, S_8 (c) Phosphorus molecule, P_4 (d) Hydrochloric acid, HCI (e) Nitric acid, HNO_3 OR 1.What are the postulates of Bohr's model of an atom?	5

	2. What is the gold foil experiment? Name the scientist who performed this experiment. Write the conclusions and shortcomings of Rutherford's model of atom.	
	SECTION C	
26.	A car accelerates from 36 km/h to 72 km/h in 10 seconds. Its acceleration is — **A)** 1 m/s^2 B) 2 m/s^2 C) 5 m/s^2 D) 10 m/s^2	1
27.	In a velocity–time graph, the area enclosed between the graph and the time axis represents — **A)** Acceleration B) Velocity **B)** Distance or displacement D) Rate of change of acceleration	1
28.	If the momentum of a body is doubled while its mass remains constant, its velocity becomes — **A)** Half B) Double **B)** C) Four times D)Remains same	1
29.	When a ball falls freely from a height, the total mechanical energy **A)** Increases B) Decreases **B)** C) Remains constant D) Becomes zero	1
30.	When temperature increases, the speed of sound in air **A)** Increases B) Decreases C) Remains constant D) Becomes zero	1
31.	Which of the following waves requires a medium for propagation? **A)** Light waves B) Radio waves C) Sound waves D) X-rays	1
32.	The following question 32 consists of two statements - Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below : **A.** Both A and Reason R are true, and R is the correct explanation of A. **B.** Both A and R are true, but R is not the correct explanation of A. **C.** A is true, but R is false. D.A is false, but R is true. Assertion (A): The weight of an object is less at the equator than at the poles. Reason (R): The value of acceleration due to gravity is less at the equator than at the poles.	1

33.	The following question 33 consists of two statements -Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below : **A.** Both A and Reason R are true, and R is the correct explanation of A. **B.** Both A and R are true, but R is not the correct explanation of A. **C.** A is true, but R is false. **D.** A is false, but R is true. Assertion (A): Ultrasounds are high frequency waves. Reason (R): Ultrasonic waves can detect very small obstacles due to their short wavelength.	1
34.	Define buoyant force. On what factors does it depend?	2
35.	A sound wave has a frequency of 256 Hz and wavelength of 1.3 m. Calculate its speed. OR List two uses of multiple reflection of sound with proper explanation.	2
36.	Derive third equation of motion arithmetically.	3
37.	a. Give three differences between acceleration due to gravity (g) and universal gravitational constant (G). b. Define acceleration due to gravity. Derive an expression for acceleration due to gravity in terms of mass of the earth (M) and universal gravitational constant (G).	3
38.	A cricket player catches a fast-moving ball by pulling his hands backward while catching it. If he tries to stop the ball suddenly without moving his hands back, he may hurt his palms. The force applied on the ball brings it to rest, and by increasing the time duration of stopping the ball, the impact force is reduced. **A.** Define Momentum. What is its SI unit of momentum. **B.** Why does a cricket player moves his hand backward while catching the ball? **Attempt either option C or D.** **C.** A ball of mass 0.5 kg is moving with a speed of 10 m/s. It is stopped by a player in 0.2 s. Find the average force applied by the player. OR **D.** A body of mass 3 kg moves with a velocity 4 m/s. Calculate its momentum.	4

39.	**Attempt either option A or B.** A. (i) The potential energy of a freely falling object decreases progressively. Does this violate the law of conservation of energy? Why? ii)Derive an expression for the kinetic energy of an object. iii) State Archimedes' Principle. Mention its two applications. iv) What is the work done by the force of gravity in the following cases ? (a) Satellite moving around the earth in a circular orbit of radius 35000 km. (b) A stone of mass 250 g is thrown up through a height of 2.5 m. OR B.(i) A man lifts a bag of 20 kg from the ground and put it on his head 2 m above the ground. Calculate the work done by him on the bag. ii) Illustrate the law of conservation of energy by discussing the energy changes which occur when we draw a pendulum bob to one side and allow it to oscillate. Why does the bob eventually come to rest ? What happens to its energy eventually ? Is it a violation of the law of conservation of energy ? iii) Find the energy possessed by an object of mass 20 kg when it is at a height of 15 m above the ground. Given g= 9.8 m/s2	5