SHREE RADHEY COACHING CENTER

CLASS 10 - SCIENCE

Sample Paper 1

Time Allowed: 3 hours **Maximum Marks: 80**

General Instructions:

1. The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
2. Section–A - question no. 1 to 20 - all questions and parts thereof are of one mark each. These questions contain multiple-choice questions (MCQs), very short answer questions and assertion - reason type questions. Answers to these should be given in one word or one sentence.
3. Section–B - question no. 21 to 26 are short answer type questions, carrying 2 marks each. Answers to these questions should in the range of 30 to 50 words.
4. Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.
5. (v) Section–D – question no. - 34 to 36 are long answer type questions carrying 5 marks each. Answers to these questions should be in the range of 80 to 120 words.
6. There is no overall choice. However, internal choices have been provided in some questions. A student has to attempt only one of the alternatives in such questions.
7. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. We need to balance a skletal chemical equation. Give reason to justify the statement. **[1]**

   OR

   Is hydrogen gas evolved on reaction of silver metal with dilute sulphuric acid (H_2SO_4) ? if not, why?
2. Is the **Burning of Liquefied Petroleum Gas (LPG)** physical or chemical changes? **[1]**
3. Carbon forms four covalent bonds by sharing its four valence electrons with four univalent atoms, e.g. hydrogen. After the formation of four bonds, carbon attains the electronic configuration of **[1]**

   a) helium b) neon

   c) argon d) krypton
4. Define the refractive index of a transparent medium. What is its unit? Which has a higher refractive index glass or water? **[1]**
5. Why is the colour of the clear sky blue? **[1]**
6. What the colour of litmus in neutral solution ? **[1]**

OR

A solution has pH of 7. Explain how would you

i. decrease its pH?

ii. increase its pH

7. Why are coils of electric toasters and electric irons made of an alloy rather than a pure metal ? **[1]**

8. Name the type of current: **[1]**

a. used in household supply,

b. given by a cell.

9. A wire of resistivity ρ is pulled to double its length. What will be its new resistivity? **[1]**

OR

What causes the potential difference between the two terminals of a cell?

10. What is the food of Amoeba? **[1]**

11. Name the end products of pyruvate in case of alcoholic fermentation. **[1]**

OR

What is the source of oxygen liberated in photosynthesis?

12. If a harmful chemical enters in food chain comprising snakes, peacock, mice and plants, which of these organisms is likely to have the maximum concentration of this chemical in its body? **[1]**

OR

Among carnivores, decomposers, herbivores and producers, how does energy flow in an ecosystem, occur through these organisms?

13. Name the electron emitter and electron acceptor of light reaction. **[1]**

14. **Assertion:** Quicklime reacts vigorously with water releasing a large amount of heat. **[1]**
Reason: The above chemical reaction is an exothermic reaction.

a) Both assertion and reason are CORRECT and reason is the CORRECT explanation of the assertion.

b) Both assertion and reason are CORRECT but, reason is NOT THE CORRECT explanation of the assertion.

c) Assertion is CORRECT but, reason is INCORRECT.

d) Assertion is INCORRECT but, reason is CORRECT.

15. **Assertion (A):** Man is a herbivore. **[1]**
Reason (R): Omnivores eat both plant food and meat of animals.

a) A is false but R is true.

b) Both A and R are true and R is correct explanation of the assertion.

c) Both A and R are true but R is not the correct explanation of of the assertion

d) A is true but R is false.

OR

Assertion (A): Carbohydrate digestion mainly takes place in the small intestine.
Reason (R): Pancreatic juice contains the enzyme lactase.

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

b) Both A and R are true but R is not the correct explanation of the assertion

c) A is true but R is false.

d) A is false but R is true.

16. **Assertion (A):** A geneticist crossed two pea plants and got 50% tall and 50% dwarf in the progeny. **[1]**

Reason (R): One plant was heterozygous tall and the other was dwarf.

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

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

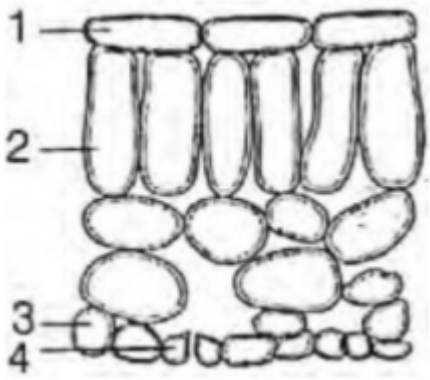
c) A is false but R is true.

d) A is true but R is false.

17. **Read the following and answer any four questions:** **[4]**

Leena is a class X girl and actively participates in the Green School programme. She planted some trees as she needs to know and observe how plants grow by preparing their own food. She placed a potted plant in her room and observed after 3-4 weeks that leaves turned pale-yellow instead of green in colour. She realized her mistake and kept the plant back in the sunlight.

i. The diagram shows the arrangement of cells inside the leaf of a green plant.



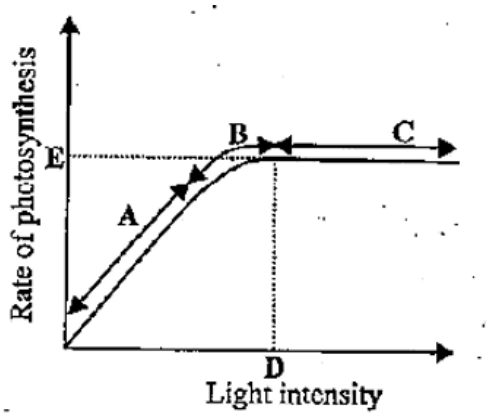
Which cells normally contain chloroplast?

a. 1 and 2
b. 1 and 4
c. 2 and 4
d. 2 and 3

ii. In photosynthesis which substances are used up, which are produced and which are necessary but remains unchanged after the reaction?

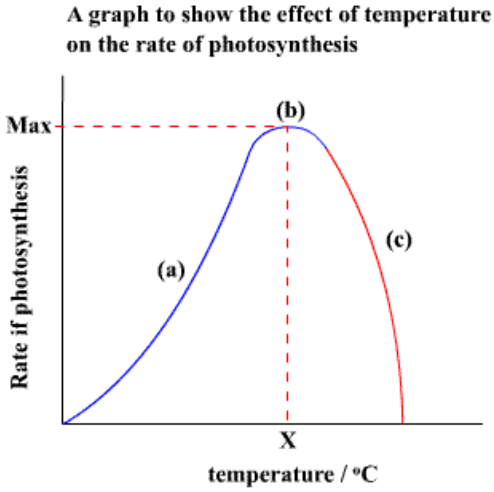
	Substance used up	Produced	Remain unchanged
(a)	Carbon dioxide	Water	Oxygen
(b)	Chlorophyll	Carbon dioxide	Water
(c)	Oxygen	Starch	Cellulose
(d)	Water	Oxygen	Chlorophyll

iii. The following graph shows the effect of light intensity on the rate of photosynthesis which of the following statement/statements is correct?



a. Light is a limiting factor in the region A
b. Region C represents that rate of photosynthesis is not increased further by increasing light intensity because some other factors become limiting
c. Point D represents the intensity of light at which some other factors becomes limiting
d. All of these

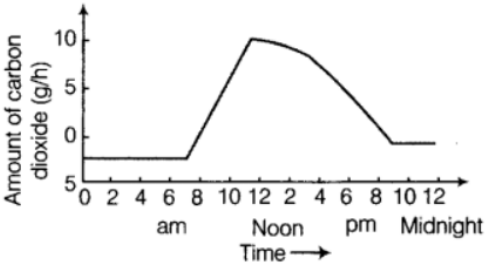
iv.



At what point is optimum temperature reached?

a. Region (a)
b. Point (b)
c. Region (c)
d. None of these

v. The graph shows how the amount of CO_2 taken in by a plant varies through a 24 hour period.



At what time of the day was the rate of photosynthesis the greatest?

a. At 7 am
b. At 12 (noon)
c. At 10 pm

d. At 6 am

18. **Read the following and answer any four questions:** **[4]**

Salt of a strong acid and strong base is neutral with a pH value of 7. NaCl common salt is formed by a combination of hydrochloride and sodium hydroxide solution. This is the salt that is used in food. Some salt is called rock salts bed of rack salt were formed when seas of bygone ages dried up. The common salt thus obtained is an important raw material for various materials of daily use, such as sodium hydroxide, baking soda, washing soda, bleaching powder.

i. Which of the following does not form an acidic salt?
   a. Phosphoric acid
   b. Carbonic acid
   c. Hydrochloric acid
   d. Sulphuric acid

ii. Which of the following salts has no water of crystallization?
   a. Blue vitriol
   b. Washing soda
   c. Baking soda
   d. Gypsum

iii. The formula of baking soda is
   a. K_2CO
   b. $KHCO_3$
   c. $NaHCO_3$
   d. Na_2CO_3

iv. Which of the following is treated with chlorine to obtain bleaching powder
   a. $CaSO_4$
   b. $Ca(OH)_2$
   c. $Mg(OH)_2$
   d. KOH

v. Which of the following salt is used for removing the permanent hardness of water
   a. Washing soda
   b. Baking soda
   c. Bleaching powder
   d. NaOH

19. **Read the following and answer any four questions:** **[4]**

A battery is a source of electrical energy. The chemical reaction within the cell generates the potential difference between its 2 terminal that sets the electron in the motion to flow the current through the resistor for the steady current I, the amount of heat H produce in time T is H = VIT applying ohm's law, we get joule's law of heating. The heating effect of electric current has many useful applications such as electric laundry iron, toaster etc. Another common application of joules heating is a fuse.

i. Joule's law of heating implies that heat production in a resistor is:

a. directly proportional to the square of current for a given resistor
b. directly proportional to resistance for a given current
c. directly proportional to time for which current flow through the resistor
d. all of these

ii. Joule's law of heating is:

a. $H = IR^2T$
b. $H = I^2RT$
c. $H = IRT^2$
d. $H = IRT$

iii. The melting point of tungsten is:

a. 3380°C
b. 4450°C
c. 3370°C
d. 3350°C

iv. The bulbs are usually filled with:

a. chemically inactive nitrogen
b. argon gases
c. both (a) and (b)
d. none of these

v. The fuse is placed in _____ with the device.

a. series
b. parallel
c. perpendicular
d. diagonal

20. **Read the following and answer any four questions:** **[4]**

Sodium and chlorine are opposite charge ions that attach each other to form an ionic compound. In which sodium atom has 1 electron in its outermost M shell it loses 1 electron now L shell and obtained stable octet. While chlorine gains 1 electron to attain a stable configuration. They both combined to form NaCl. Ionic compounds have a high melting and boiling point. They are soluble in water.

i. Ionic compounds are held together by:

a. van der Waal
b. hydrogen bond
c. dipole- dipole
d. strong electrostatic force

ii. An ionic compound is formed by:

a. sharing of electron
b. transfer of electron
c. both (a) and (b)

d. none of these

iii. Ionic compound conducts electricity in a molten state because

a. ions move freely

b. the electrostatic force of attraction between ions is overcome due to heat

c. ion is not able to move

d. both (a) and (b)

iv. The atomic number of an element Y is 17. The number of electrons in its ion Y^- will be

a. 17

b. 18

c. 19

d. 20

v. Which one of the following properties is generally not exhibited by ionic compounds?

a. Solubility in Water

b. Electrical conductivity in solid-state

c. High melting and boiling point

d. Electrical activity in a molten state

Section B

21. Name the process by which root absorbs (a) Water from the soil (b) Mineral salts from the soil. **[2]**

OR

Explain the role of mouth in digestion of food.

22. State one main function of Nephron of kidney tubule. **[2]**

23. In electron dot structure, the valence shell electrons are represented by crosses or dots. **[2]**

i. The atomic number of chlorine is 17. Write its electronic configuration.

ii. Draw the electron dot structure of chlorine molecule.

24. What are strong and weak acids? In the following list of acids, separate strong acids from weak acids: **[2]**

Hydrochloric acid, citric acid, acetic acid, nitric acid, formic acid, sulphuric acid

25. "The magnification produced by a spherical mirror is -3." List four information you obtain from this statement about the mirror/image. **[2]**

26. Draw the symbols of the following components that are used in the circuit diagram: **[2]**

i. Wires crossing without joining

ii. Variable resistance or rheostat

iii. A battery or a combination of cells

27. Mendel observed two kinds of ratios 3 : 1 and 1 : 2 : 1 in F2 generation in his experiments on garden pea. Name these two kinds of ratios respectively. **[3]**

OR

What do you understand by origin of life? Explain.

28. What is meant by non-biodegradable waste? Identify biodegradable waste from the following. **[3]**

Empty packet of chips, empty plastic bottle of mineral water, empty paper box of sweets, empty tin of cold drink.

29. Write a short note on root pressure. **[3]**

30. What are double displacement reaction? **[3]**

31. Neon and argon are unreactive gases. **[3]**

i. What do their atoms have in common?

ii. Why are they non-reacting gases?

32. Why did Mendeleev leave some gaps in his Periodic Table? **[3]**

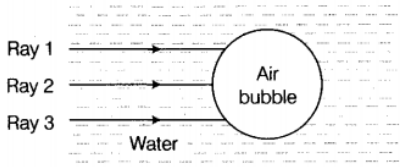
33. Why is it difficult to drive on a foggy day? **[3]**

34. a. List four characteristics of the images formed by plane mirrors. **[5]**

b. A 5 cm tall object is placed at a distance of 20 cm from a concave mirror of focal length 30 cm. Use mirror formula to determine the position and size of the image formed.

OR

An air bubble in water is shown in the figure. Three rays of light are incident on the air bubble.



The angle of incidence of ray 1 on the air bubble is greater than the critical angle. The angle of incidence of ray 2 on the air bubble is less than the critical angle. Ray 3 is perpendicular to the surface of the bubble.

i. In figure at the point where ray 1 meets the air bubble, mark

a. the normal to the surface

b. the angle of incidence

ii. Complete the ray diagram to show how all three rays continue after they meet the air bubble.

iii. Define refractive index of water. If the speed of light in air is 3×10^8 ms^{-1} and the speed of light in water is 2.2×10^8 ms^{-1}. Calculate the refractive index of water.

35. Explain various steps of budding in yeast. **[5]**

36. i. Explain the meanings of words "electromagnetic" and "induction" in the term electromagnetic induction. List three factors on which the value of induced current produced in a circuit depends. **[5]**

ii. Name and state the rule used to determine the direction of induced current. State one practical application of this phenomenon in everyday life.

OR

a. Name and state the rule to find the direction of force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it.

b. Draw a well labelled diagram of an electric motor.