CBSE Class 10 Science

Sample Paper 03 (2020-21)

Maximum Marks: 80

Time Allowed: 3 hours

General Instructions:

i. The question paper comprises four sections A, B, C and D. There are 36 questions in the question paper. All questions are compulsory.
ii. 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.
iii. 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.
iv. 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.
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.
vi. 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.
vii. Wherever necessary, neat and properly labeled diagrams should be drawn.

Section A

1. Give one example of a combination reaction which is also exothermic.

OR

Name the type of reaction : Iron reacts with chlorine to form ferric chloride.

2. What is the role of a catalyst in a chemical reaction?
3. The number of C - H bonds in ethane C_2H_6 molecule is:

   a. 8

b. 10

c. 4

d. 6

4. Can a plane mirror be called a spherical mirror?
5. Which phenomenon is responsible for increasing the apparent length of the day by 4 min?
6. What happens at cathode when an electric current is passed through an aqueous solution of an acid ?

OR

What is pH of tomato juice ?

7. A current of 0.5 A is drawn by a filament of an electric bulb for 10 minutes. Find the amount of electric charge that flows through the circuit.
8. What does the divergence of magnetic field lines near the ends of a current carrying straight solenoid indicate?
9. A battery of 9V is connected in series with resistors of 0.2Ω, 0.3Ω, 0.4Ω, 0.5Ω and 12Ω respectively. How much current will flow through a 12Ω resistor?

OR

What is measured by a voltmeter ?

10. What is the food of Amoeba?
11. What are the adaptation of leaf for photosynthesis?

OR

Name the system responsible for transportation of materials in human body.

12. To keep the environment clean, garbage disposal programme is an essential prerequisite. What methods constitute the garbage disposal programme?

OR

Would you eat animals or plants to get more calories of heat?

13. What are the end products of photosynthesis?
14. **Assertion:** $Fe_2O_3 + 2\ Al \rightarrow Al_2O_3 + 2\ Fe$

The above chemical equation is an example of a displacement reaction.

Reason: Aluminium is more reactive than iron, displaces Fe from its oxide.

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.

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.

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:**

Ayush experienced muscular cramps during the training session for his upcoming cricket match. His coach advised him on a schedule of aerobic exercises to overcome this problem. Ayush followed his coach's advice and did not experience any muscular cramps

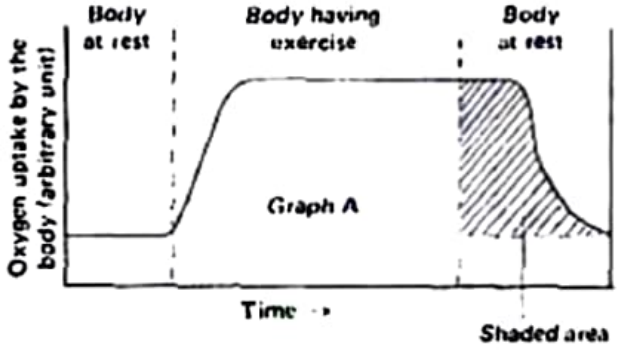
during the game.

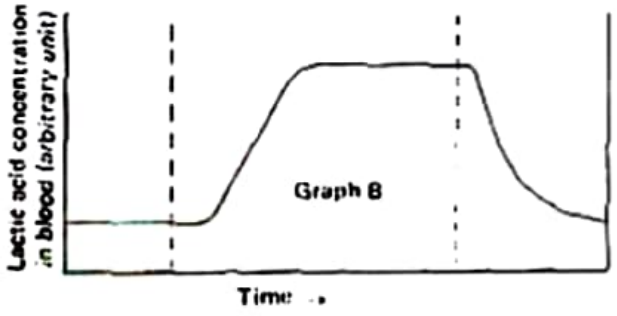
i. Lack of oxygen in muscles often leads to cramps due to
   a. conversion of pyruvate to ethanol
   b. non-conversion of glucose to pyruvate
   c. conversion of pyruvate to glucose
   d. conversion of pyruvate to lactic acid

ii. Which substances are produced by anaerobic respiration in yeast?

	Lactic acid	Carbon dioxide
a	Yes	Yes
b	Yes	No
c	No	Yes
d	No	No

iii. The two graphs show the oxygen uptake and the lactic acid concentration in the blood of a man before, during and after a short period of physical exercise:





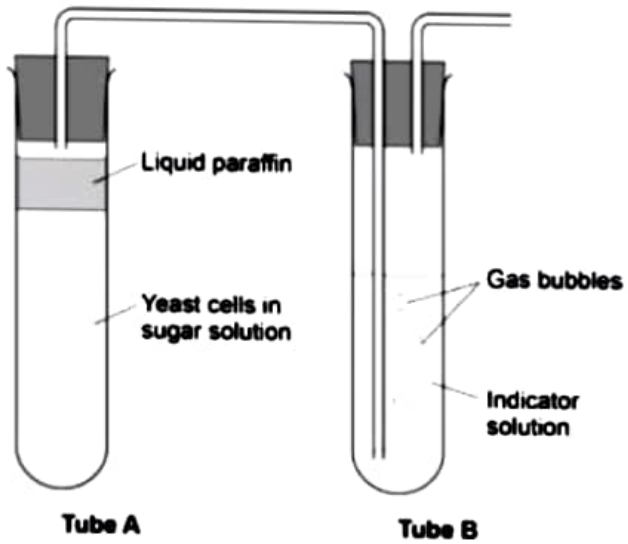
Why there is an increase in lactic acid concentration in the blood at the beginning of exercise?

   a. Lack of oxygen
   b. Excess of oxygen

c. Lack of carbon dioxide

d. Excess of carbon dioxide

iv. The diagram shows an experiment to investigate anaerobic respiration in yeast cell:



What is the purpose of liquid paraffin in tube A?

a. To prevent evaporation

b. To stop air from getting in

c. To stop the temperature from going up

d. To stop water from getting in

v. The indicator colour in tube B shows changes in the concentration of carbon dioxide If tube B contains lime water. What will be the colour after sometimes?

a. Milky

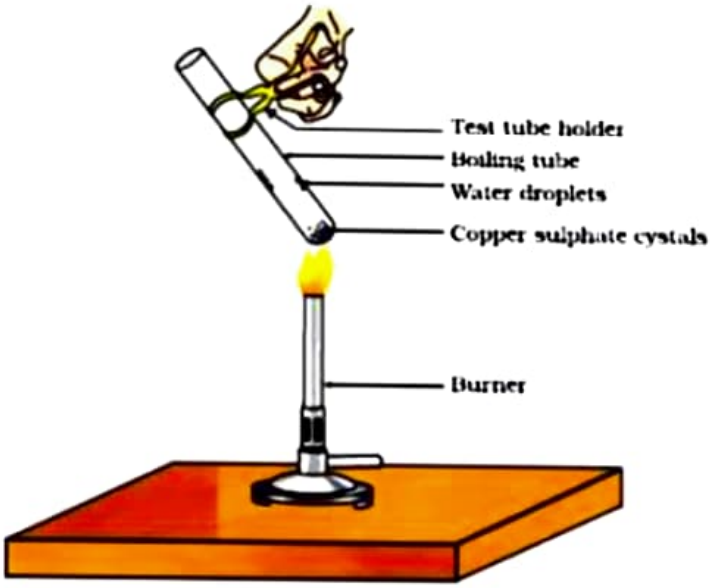
b. Black

c. Yellow

d. Blue

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

Copper sulphate crystal contains water of crystallisation when the crystal is heated the water is removed and salt turns white. The crystal can be moistened again with water. The water of crystallisation is the fixed number of water molecule present in 1 formula unit of copper sulphate. On heating gypsum at 373K, it loses water molecule and became calcium sulphate hemihydrate.



i. If the crystal is moistened with water _____ colour of crystal reappear
   a. blue
   b. green
   c. black
   d. pink

ii. What is the commercial name of calcium sulphate hemihydrate?
   a. Washing soda
   b. Bleaching powder
   c. Plaster of Paris
   d. Baking soda

iii. _____ water molecules are present in one formula unit of copper sulphate.
   a. Five
   b. Two
   c. Six
   d. Seven

iv. The calcium sulphate hemihydrate is prepared by heating one of the following to a temperature of 100C. This is
   a. $CaCO_3 \cdot \frac{1}{2} H_2O$
   b. $CaCl_2 \cdot \frac{1}{2} H_2O$
   c. $CaSO_3 \cdot \frac{1}{2} H_2O$

d. $CaSO_4 \cdot \frac{1}{2} H_2O$

v. The salt which possesses water of crystalline solution is _____.

a. baking soda

b. gypsum

c. washing soda

d. bleaching powder

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

Resistance is the property of a conductor to resist the flow of charges through it. The current which flows through a resistor is inversely proportional to its resistance, If the resistance is double the current get halves. A component of identical size that offers a higher resistance is a poor conductor. An insulator of the same size offers even higher resistance. The resistance of the material depends on various factors. The resistivity of an alloy is generally higher than that of its constituent metal.

i. The resistance of a wire of length 300m and cross-section area 1.0 mm^2 made of material of resistivity $1.0 \times 10^{-7}\ \Omega$ m is:

1. $2\ \Omega$
2. $3\ \Omega$
3. $20\ \Omega$
4. $30\ \Omega$

ii. The resistivity of metal depends on:

a. length

b. nature of material

c. area of cross-section

d. all of these

iii. What happens to the resistance as the conductor is made thicker?

a. Resistance decreases

b. Resistance increases

c. Resistance remains the same

d. None of these

iv. Metals and alloys' resistivity is in the range _____.

a. $10^{-10}\ \Omega$m to $10^{-5}\ \Omega$m

b. $10^{-8}\ \Omega$m to $10^{-6}\ \Omega$m

c. $10^{-10}\ \Omega m$ to $10^{-6}\ \Omega m$

d. $10^{-9}\ \Omega m$ to $10^{-5}\ \Omega m$

v. Why alloy is commonly used in electrical heating devices like toaster etc?

a. Alloy oxidise easily

b. Alloy does not oxidise readily at high temperature

c. Alloys is a good material

d. Alloys are easily available

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

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. What are the common features of the respiratory organs in aquatic and terrestrial animals?

OR

Why the tracheal wall is supported by 'C' shaped cartilaginous rings?

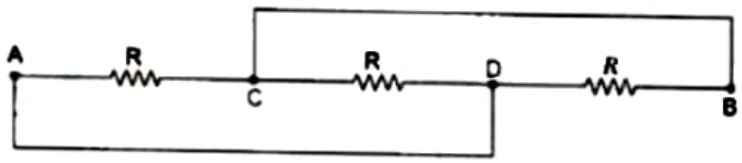
22. Why does high temperature inhibit photosynthetic action?
23. An organic compound A is a constituent of many medicines and used as an antifreeze and has the molecular formula C_2H_6O. Upon reaction with alk. $KMnO_4$, compound A is oxidised to another compound B with formula $C_2H_4O_2$. Identify the compounds A and B. Write the chemical equation for the reaction which leads to the formation of B.
24. A group of students, while on excursion trip is campaigning on the hills. One morning, they find themselves engulfed in a thick blanket of snow. One of the senior member of the group suggests to sprinkle common salt on the ice slit covering the pavement. Now answer the following questions:

i. What is the purpose of sprinkling common salt on ice slit?

ii. Can we use any other substance in place of common salt?

iii. What values are associated with the students?

25. Find the velocity of light in diamond. Given the velocity of light in glass is 2×10^8 ms^{-1}. Given refractive index of glass with respect to air is 1.5 and that of diamond with respect to air is 2.5.
26. What is the resistance between A and B in the network shown in the figure?



27. Mendel, in one of his experiments with pea plants, crossed a variety of pea plant having round seeds with one having wrinkled seeds. State Mendel's observations giving reasons

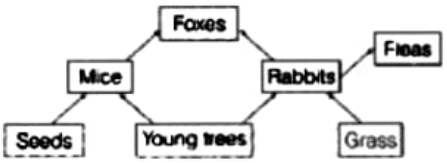
of F_1 and F_2 progeny of this cross. Also, list any two contrasting characters, other than round seeds of pea plants that Mendel used in his experiments.

OR

Anita had a huge scar on her cheek after she met with an accident during her school days. She is worried if her baby would inherit the scar she had acquired. Regarding this, she enquired it with her doctor, who upon hearing this said that she need not worry about it as her scar is an acquired trait. Read the given passage and answer the following questions:

i. What are acquired traits?
ii. How is it different from inherited traits?
iii. Mention the values of the doctor that is shown in the passage.

28. A food web is given below, observe the figure and answer the questions given below.



i. Identify the primary consumer in the food web.
ii. If all the foxes are killed due to a disease, what will your observations about food web be?

29. What is the function of digestive enzymes?
30. Explain the process of getting energy from carbohydrates.
31. Neon and argon are unreactive gases.

i. What do their atoms have in common?
ii. Why are they non-reacting gases?

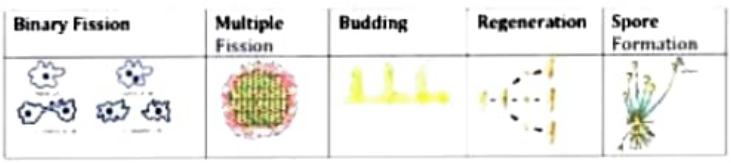
32. The three elements A, B and C with similar properties have atomic masses X, Y and Z respectively. The mass of Y is approximately equal to the average mass of X and Z. What is such an arrangement of elements called as? Give one example of such a set of elements.
33. What is Tyndall effect? Explain with an example.
34. Find the size, nature and position of image formed when an object of size 1 is placed at a

distance of 15 cm from a concave mirror of focal length 10 cm.

OR

Write laws of refraction. Explain the same with the help of ray diagram, when a ray of light passes through a rectangular glass slab.

35. The diagram shows modes of asexual reproduction in animals.



Using the above diagram, answer the following questions:

i. Name one organism each which reproduces by binary fission and multiple fission.
ii. What is the difference between binary fission and multiple fission?
iii. How Planaria reproduces?
iv. In which reproductive method an organism produces an outgrowth on its body surface?
v. How Rhizopus reproduces under suitable conditions?

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.
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.