SCIENCE SAMPLE PAPER-4

A Highly Simulated Practice Questions Paper for CBSE Class X Examination

e : 3 hrs

Max. Marks : 80

structions

(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** Qns. 1 to 20 all questions and parts there of 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** Qns. 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** Qns. 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** Qns. 34 to 36 are long answer type question carrying 5 marks each. Answer 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 labelled diagrams should be drawn.

Section A

1. An object is placed at a distance of 10 cm in front of a plane mirror, then determine the distance of image from mirror.

Or

An object is placed 20 cm from the concave mirror of focal length 10 cm, then where will the image be formed?

2. "Carbon tetrachloride is not a good conductor of electricity". Give reason to justify this statement.

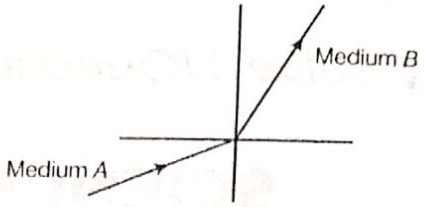
3. While breathing out, point out the changes you think occur in diaphragm and intercostal muscles.

You are advised to attempt this sample paper without referring the answers given here. However, cross check your answers with the answers given at the end of paper after you complete the paper.

4. Velocity of light in air is 3×10^8 m/s while its velocity in a medium is 2.5×10^8 m/s. Find refractive index of this medium.

Or

A light ray enters from medium *A* to medium *B* as shown in the figure. Will the refractive index of medium *B* relative to medium *A* be greater than or less than unity?



5. pH of four solutions *A*, *B*, *C* and *D* are 2, 7, 8 and 6 respectively. What is the correct order of acidity of these solutions?

6. Name the enzymes are involved in the starch digestion in mouth?

Or

Name the method by which *Hydra* reproduces. Is this method is sexual or asexual?

7. 100 J of heat is produced each second in a 4 Ω resistance. Determine the potential difference across the resistor.

8. While cooking, if the bottom of the vessel is getting black on the outside, what it means?

Or

What are oxidising agents?

9. What happens to glucose that enter the nephron along with filterate?

Or

Why respiration in considered as an exothermic process?

10. Give the relation between the amplitude of scattered light and wavelength of light.

11. An element *A* burns with golden flame in air. It reacts with another element *B* (atomic number 17) to give a product *C*. An aqueous solution of product *C* on electrolysis gives a compound *D* and liberates hydrogen. Determine compound *D*.

12. What is the colour of the emergent ray when a white light is incident on a thin-walled hollow glass prism?

13. What are alloys?

Or

What is a homologous series? Explain with an example.

Assertion-Reason Type Questions (Q. Nos. 14-16)

In each of the following questions, a statement of Assertion is given by the corresponding statement of Reason. Of the statements, mark the correct answer as

(a) If both Assertion and Reason are true and Reason is the correct explanation of Assertion.

(b) If both Assertion and Reason are true, but Reason is not the correct explanation of Assertion.

(c) If Assertion is true, but Reason is false.

(d) If Assertion is false, but Reason is true.

14. **Assertion** Transpiration is a process in which water is lost in the form of water vapour.
Reason Transpiration occurs through the guard cells present on the leaves.

15. **Assertion** The graph of *V versus I* for a conductor is straight line.
Reason According to Ohm's law, electric current flowing through a conductor is directly proportional to potential difference across its ends.

16. **Assertion** Food cans are coated with tin and not with zinc.
Reason Because zinc is less reactive than tin.

Answer Q. Nos. 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.

17. *Read the following and answer any four questions from 17 (i) to 17 (v).*

Flowering plants reproduce sexually by the process known as pollination. In this process the pollen from male anther is transferred to the female stigma. On the basis of this process, answer the following questions.

17. (i) Which of the following is the correct sequence of event of sexual reproduction in flower?
(a) Pollination, fertilisation, seedling, embryo
(b) Seedling, embryo, fertilisation, pollination
(c) Pollination, fertilisation, embryo, seedling
(d) Embryo, seedling, pollination, fertilisation

17. (ii) The two nuclei at the end of the pollen tube are called
(a) tube nucleus and generative nucleus
(b) sperm and ovum
(c) generative nucleus and stigma
(d) tube nucleus and sperm

17. (iii) Double fertilisation involves
(a) fertilisation of an egg by two male gametes
(b) fertilisation of two eggs in the same embryo sac by two sperm brought by one pollen tube
(c) fertilisation of egg and central cell by two sperms brought two different pollen tubes
(d) fertilisation of egg and central cell by two sperms brought by same poller tube.

17. (iv) Which one of following is one of the characteristic of self-pollinated flower?
(a) flowers are large and showy
(b) flower remain closed and do not open
(c) stigma and anthers mature at the same time
(d) Pollen is produced in very large quantities

7. (v) Which one of the following statement is not true?
(a) Exine of pollen grain is made up of sporopollenin
(b) Pollen grains of many species cause seven allergies
(c) Pollen in liquid nitrogen can be used in the crop breeding programmes
(d) Tapetum helps in dehiscence of anther

18. *Read the following and answer any four questions from 18(i) to 18(v).*

Study these information related to answer the any four questions that follow.

Element	Atomic number	Electronic configuration
A	11	2, 8, 1
B	13	2, 8, 3
C	19	2, 8, 8, 1
D	20	2, 8, 8, 2
E	17	2, 8, 7

18. (i) Write the increasing order of elements *A*, *C*, *D* on basis of their characteristics.
(a) $D < C < A$ (b) $C < D < A$ (c) $A < D < C$ (d) $D < A < C$

18. (ii) Which element can form amphoteric oxide?
(a) None (b) *B* (c) *E* (d) *D*

18. (iii) Which of the following statement is correct about '*A*'?
(i) It is highly reactive.
(ii) It is immersed in kerosene to prevent reactivity in atmosphere.
(iii) It is metallic in nature.
(iv) It have high value of electronegativity.
(a) (i), (ii) (b) (ii), (iii), (iv) (c) (i), (ii), (iii) (d) only (ii)

18. (iv) Which of the following statement is correct?
(a) *B* is noble gas (b) *C* have valency of –1
(c) *D* is metallic in nature (d) *A* belong to 'p'-block

18. (v) Which of the following pair belong to same period?
(a) *A*, *B*, *E* (b) *A*, *B*, *C*, *D* (c) *A*, *D* (d) *D*, *E*

19. *Read the following and answer any four questions from 19 (i) to 19 (v).*

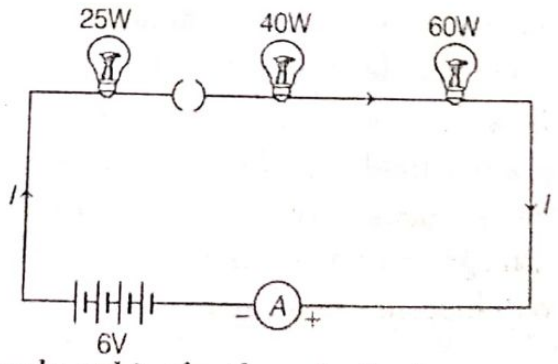
When an electric current is passed through a high resistance wire like nichrome wire the resistance wire becomes very hot and produces heat. Heat produced is given by

$$H = I^2Rt$$

where, *I* is the current, *R* is the resistance and *t* is time for which current is passed.

19. (i) If the current passing through a conductor is doubled, the change in heat produced will become
(a) two times (b) three times
(c) four times (d) None of these

19. (ii) In the circuit given below,

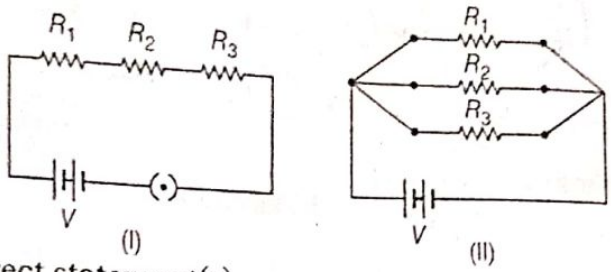


The order of heat produced in the three bulbs is
(a) $H_{25W} < H_{40W} < H_{60W}$ (b) $H_{25W} > H_{40W} > H_{60W}$
(c) $H_{25W} = H_{40W} = H_{60W}$ (d) $H_{25W} > H_{40W} < H_{60W}$

19. (iii) The filament type electric bulbs are not power efficient because
(a) most of the electric power consumed by filament is converted into light
(b) small amount of electric power consumed by filament is converted into heat
(c) most of the electric power consumed by filament appears as heat and small amount of power is converted into light
(d) None of the above

19. (iv) A potential difference of 250 V is applied across a resistance of 500 Ω in an electric iron. The heat produced in 10 s will be
(a) 1050 J
(b) 1250 J
(c) 1520 J
(d) 1650 J

19. (v) Two electric circuits I and II are shown below



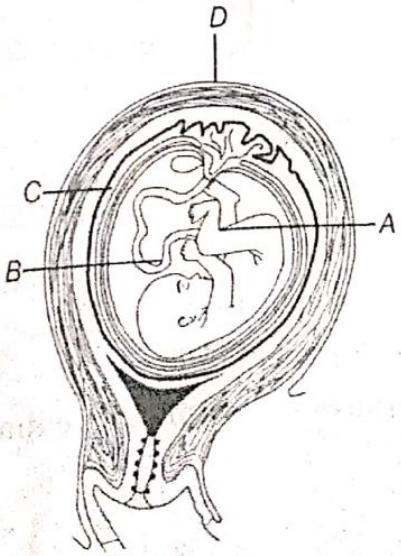
Choose the correct statement(s).
(a) If $R_1 > R_2 > R_3$, more heat will be produced in R_1 in circuit I.
(b) If $R_1 > R_2 > R_3$, more heat will be produced in R_1 in circuit II.
(c) If $R_1 > R_2 > R_3$, equal heat will be produced in both the circuits.
(d) None of the above

20. *Read the following and answer any four questions from 20 (i) to 20 (v).*

Placenta is a disc-like structure in the lining of the uterine wall. It contain villi on the embryo side of the tissues and blood space on the mother side surround the uilli. On the basis of above passage answer the following questions.

20. (i) Which of the following is not a true statement about a placenta?
(a) It is an organ that is found in all species
(b) It attaches the foetus to uterine wall
(c) Provide nutrients to the foetus
(d) It allow the foetus to transfer waste products to the mother bloodstream.

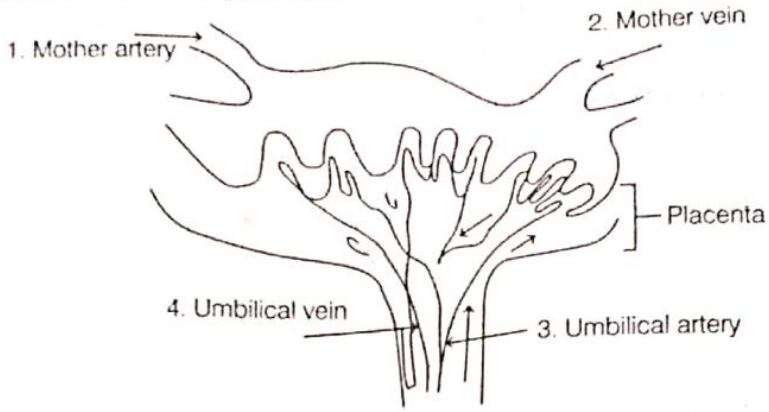
20. (ii) The diagram show a developing foetus. Where does gaseous exchange between mother and foetus occur?



20. (iii) What are the features of human eggs, when comprised with sperm?

	Size of human egg	Number of sperms
(a)	large	small
(b)	large	large
(c)	small	large
(d)	small	small

20. (iv) The diagram show part of placenta



In which part does the blood contain the most oxygen and nutrients?

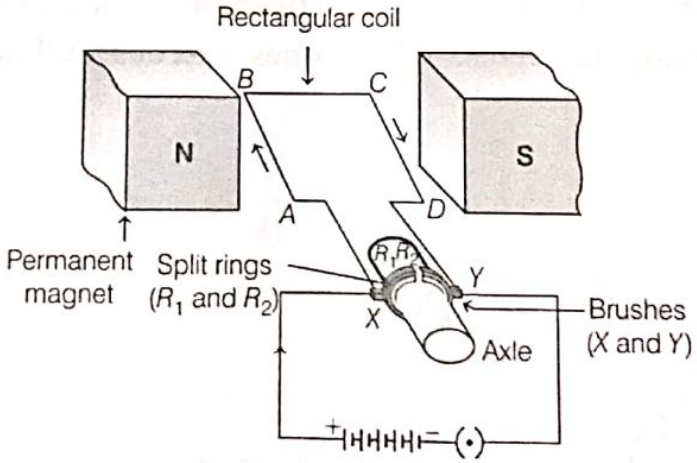
(a) 1 and 3 (b) 1 and 4
(c) 2 and 3 (d) 2 and 4

20. (v) Where is ovulation most likely to occur?

(a) about halfway between the start of one menstruation and the next
(b) at the ~~of~~ end of menstruation
(c) 1-5 days before the start of menstruation
(d) 5-10 days after the start day of menstruation

Section B

21. Electric motor is a rotating device used for converting electric energy into mechanical energy. The diagram of electric motor is given below



A simple electric motor

Explain the functions of the following parts shown in above diagram:

(i) Permanent magnet
(ii) Split rings (commutator)

22. Iqbal treated a lustrous, divalent element *M* with sodium hydroxide. He observed the formation of bubbles in reaction mixture. He made the same observation when this element was treated with hydrochloric acid. Suggest how can he identify the produced gas? Write chemical equations for the reactions involved.

23. (i) Why is 'reproductive health education' important?
(ii) Why is birth control necessary?

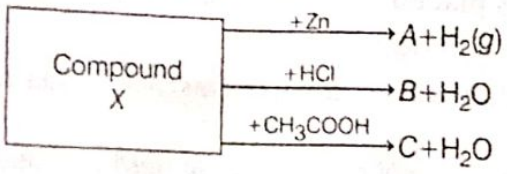
Or

Mention the function of the following reproductive structures present in female reproductive system.
(i) Vagina (ii) Oviduct

24. Observe the following table carefully and match the components of part I with part II of the table. Write the information about correct matches in complete sentences.

Part I	Part II
Human beings	Transpiration
Unicellular organisms	Urination
Plants	Diffusion

25. Identify the compound *X* on the basis of the reactions given below. Also, write the name and chemical formulae of *A*, *B* and *C*.



Or

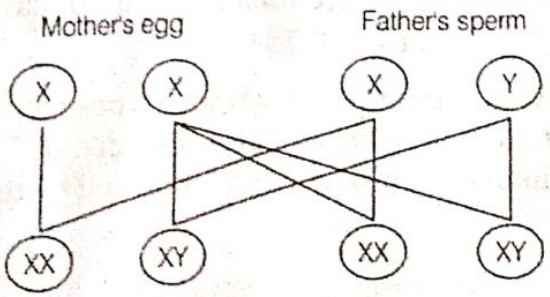
How the following substances will dissociate to produce ions in their solutions?
(i) Hydrochloric acid (ii) Nitric acid
(iii) Sulphuric acid (iv) Sodium hydroxide
(v) Potassium hydroxide (vi) Magnesium hydroxide

26. Derive the formula for equivalent resistance when three resistors R_1, R_2 and R_3 are connected in series.

Section C

27. (i) Draw a diagram of excretory system in human beings and label on it: Aorta, vena cava, urinary bladder, urethra.
(ii) List two vital functions of the kidney.

28. Consider the following cross which describes the process of sex-determination in human beings.



Recompile the information given above and write about it in your own words.

29. (i) What do you understand by the powers of a lens? Define the unit of power of lens.
(ii) Two thin lenses of powers +3.5D and −2.5D are placed in contact. Find the power and focal length of the lens combination.

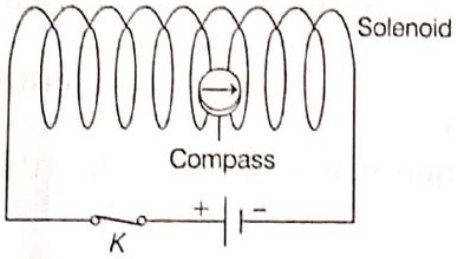
30. Elements forming ionic compounds attain noble gas electronic configuration by either gaining or losing electrons from their valence shells. Explain giving reason why carbon cannot attain such a configuration in this manner to form its compounds. Name the type of bonds formed in ionic compounds and in the compound formed by carbon. Also explain, why covalent compounds have low melting point?

31. A metal carbonate *X* on heating with an acid gives a gas which when passed through a solution *Y* gives the carbonate back. On the other hand, a gas *G* that is obtained at anode during electrolysis of brine is passed on dry *Y*, it gives a compound *Z*, used for disinfecting drinking water. Identify *X*, *Y*, *G* and Z.

32. A copper coil is connected to a galvanometer. What would happen, if a bar magnet is
(i) pushed into the coil with its North-pole entering first,
(ii) at rest inside the coils and
(iii) pulled out again?

Or

A plotting compass is placed inside a solenoid and the compass needle is pointing in the direction as shown in figure.
(i) Complete the diagram by drawing arrow heads to indicate the direction of the current flow.
(ii) Describe the direction of the magnetic field inside the solenoid.
(iii) If key *K* is opened, what will happen to the compass needle?



Section D

33. The biotic components can be grouped according to the manner in which they obtain their sustenance from the environment? Elaborate the various groups into which the various biotic components are classified.

34. (a)(i) The magnification produced by a plane mirror is +1. What does it mean?
(b) What is the nature of the image formed by a concave mirror, if the magnification produced by the mirror is – 0.75?
(ii) A bus uses a convex mirror as view finder whose radius of curvature is 4 m. A car is coming behind the bus, which is at a distance of 20 m. What will be the position and size of the image of the car when observed by the driver of the bus through the convex mirror?

(i) Power of lens is + 1. 5 D. Find the focal length of the lens. Is the prescribed lens diverging or converging?

(ii) Calculate the distance at which an object should be placed infront of a concave lens of focal length 30 cm to obtain an image of half of its size.

Or

35. What is water of crystallisation? Write the common name and chemical formula of a commercially important compound which has ten water molecules as water of crystallisation. How is this compound obtained? Explain by giving chemical equations. List any two uses of this compound.

36. Differentiate between the following terms:

(i) Vegetative propagation and spore formation

(ii) Bud of *Hydra* and *Bryophyllum*

(iii) Fragmentation and regeneration

(iv) Fission in *Amoeba* and *Plasmodium*

(v) Pollen tube and style

Or

Write the function of the following

(i) Prostate gland

(ii) Penis

(iii) Urethra

(iv) Testis

(v) ~~Scrotum~~ Ureter