SCIENCE — BOARD PRACTICE TEST

CLASS - X

TIME : 3 HRS. **MAX. MARKS : 80**

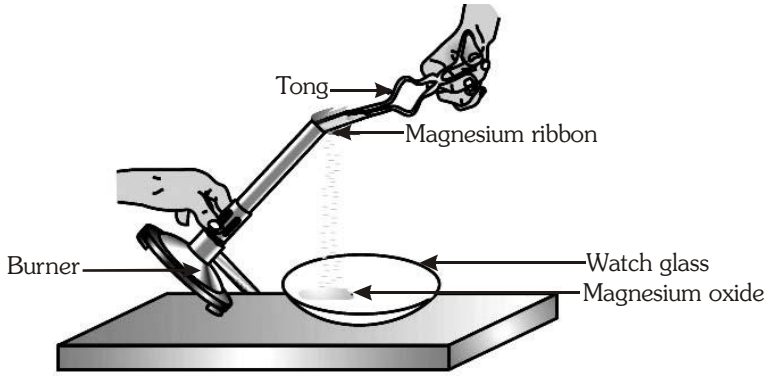
GENERAL INSTRUCTIONS :

1. **This question paper consists of 39 questions in 5 sections.**
2. **All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.**
3. **Section A consists of 20 objective type questions carrying 1 mark each.**
4. **Section B consists of 6 Very Short questions carrying 02 marks each. Answers to these questions should in the range of 30 to 50 words.**
5. **Section C consists of 7 Short Answer type questions carrying 03 marks each. Answers to these questions should in the range of 50 to 80 words.**
6. **Section D consists of 3 Long Answer type questions carrying 05 marks each. Answer to these questions should be in the range of 80 to 120 words.**
7. **Section E consists of 3 source-based/case-based units of assessment of 04 marks each with sub-parts.**

SECTION-A

Select and write one most appropriate option out of the four options given for each of the questions from 1 to 20.

1.



Which of the following is the correct observation of the reaction shown in the above set up?

(Chemistry)

(1) Brown powder of Magnesium oxide is formed.

(2) Colourless gas which turns lime water milky is evolved.

(3) Magnesium ribbon burns with brilliant white light.

(4) Reddish brown gas with a smell of burning Sulphur has evolved.

2. Methane gas released from waste water treatment plants can be used as a source of fuel. Which chemical equation represents the combustion of methane to produce heat energy? **(Chemistry)**

(1) $CH_4 + CO_2 \rightarrow 2O_2 + 2H_2O$ (2) $CH_4 + 2O_2 \rightarrow CO_2 + 2H_2O$

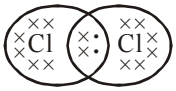
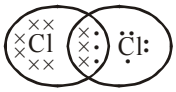
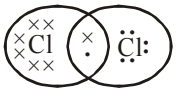
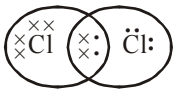
(3) $2O_2 + 2H_2O \rightarrow CO_2 + CH_4$ (4) $CO_2 + 2O_2 \rightarrow CH_4 + 2H_2O$

3. Builders use Plaster of Paris to make the surface layer of the inner walls of a building. Which property of Plaster of Paris powder makes it a suitable building material? **(Chemistry)**

(1) It is light weight. (2) It is white in colour.

(3) It is found readily in nature. (4) It gets hard when mixed with water.

4. The electron dot structure of chlorine molecule is : **(Chemistry)**

(1)  (2)  (3)  (4) 

5. A part of a homologous series is shown below.

C_3H_4, C_4H_6, C_5H_8

Which of these compounds is a part of the series shown above? **(Chemistry)**

(1) C_2H_2 (2) C_2H_4 (3) C_8H_6 (4) C_6H_{14}

6. What is X in the reaction? **(Chemistry)**

$2Al + 3H_2O \rightarrow Al_2O_3 + X$

(1) Al (2) H_2 (3) O_3 (4) AlH_3

7. Two salts X and Y are dissolved in water separately. When phenolphthalein is added to these two solutions the solution X turns pink and the solution Y does not show any change in colour, therefore X and Y are : **(Chemistry)**

	(X)	(Y)
(1)	Na_2CO_3	NH_4Cl
(2)	Na_2SO_4	$NaHCO_3$
(3)	NH_4Cl	Na_2SO_4
(4)	$NaNO_3$	Na_2SO_4

8. The internal energy (reserve food) present in autotrophs is **(Biology)**

(1) Proteins (2) Fatty acids (3) Glycogen (4) Starch

9. Which is the most correct statement with reference to human? **(Biology)**

(1) Arteries always carry oxygenated blood while veins always carry deoxygenated blood.

(2) Arteries are provided with valves while veins are devoid of valves.

(3) Arteries always carry blood away from the heart, while veins always carry blood towards the heart.

(4) Venous blood is returned to left auricle.

10. Due to lack of oxygen, which one of the following increases in a muscle cell? **(Biology)**

(1) CO_2 (2) Lactose (3) Lactic acid (4) Uric acid

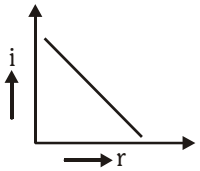
11. The presence of ADH causes an individual to excrete **(Biology)**

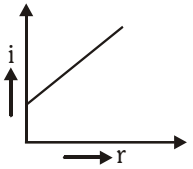
(1) More salt (2) Less water (3) More water (4) Less salt

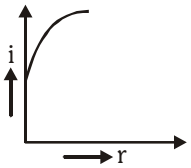
12. Thigmotropism is best exhibited by **(Biology)**

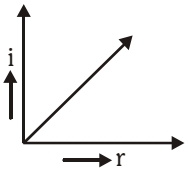
(1) Thorn (2) Tendrils (3) Root apex (4) Shoot tip

13. Which of the following correctly represents graphical relation between angle of incidence (i) and angle of reflection (r)? **(Physics)**

(1) 

(2) 

(3) 

(4) 

14. An object is immersed in a fluid. In order that the object becomes invisible, it should **(Physics)**

(1) behave as a perfect reflector

(2) absorb all light falling on it

(3) have- refractive index one

(4) have refractive index exactly matching with that of the surrounding fluid

15. If a patient is put on dialysis, he is most likely suffering from a severe disease of the **(Biology)**

(1) Circulatory system (2) Respiratory system

(3) Excretory system (4) Digestive system

16. Select the mismatched pair in the following. **(Biology)**

(1) Bio-magnification-Accomulation of chemicals at the successive trophic levels of a food chain.

(2) Ecosystem-Biotic components of environment.

(3) Aquarium-a man-made ecosystem.

(4) Parasites-organisms which obtain food from other living organisms.

Directions : Q.17 to 20 are Assertion - Reasoning based questions. These consist of two statements- Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below:

(1) Both A and R are true and R is the correct explanation of A

(2) Both A and R are true and R is not the correct explanation of A

(3) A is true but R is false

(4) A is false but R is true

17. **Assertion (A) :** Sodium hydrogen carbonate is used as an ingredient in antacids. **(Chemistry)**

Reason (R) : $NaHCO_3$ is a mild non-corrosive basic salt.

18. **Assertion :** Units which make up the nervous system are called neurons. **(Biology)**

Reason : Nerve impulses are carried by dendrites towards the cell body.

19. **Assertion :** A fuse wire is always connected in parallel with the mainline. **(Physics)**

Reason : If a current larger than the specified value flows through the circuit, fuse wire melts.

20. **Assertion :** Ozone is both beneficial and damaging. **(Biology)**

Reason : Stop the release of chlorofluorocarbons to protect the ozone.

SECTION-B

Q. no. 21 to 26 are very short answer questions.

21. The industrial process used for the manufacture of caustic soda involves electrolysis of an aqueous solution of compound 'X', In this process, two gases 'Y' and 'Z' are liberated. 'Y' is liberated at cathode and 'Z', which is liberated at anode, on treatment with dry slaked lime forms a compound 'B'. Name X, Y, Z and B. **(Chemistry)**

22. In the experimental set up on 'CO_2 is released during respiration', if one forgets to keep the vial with KOH in the conical flask, how will the result vary? Give details. **(Biology)**

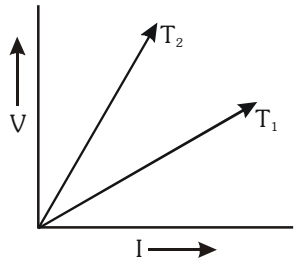
23. What is the difference between blood circulation in fishes and birds? **(Biology)**

OR

Why pancreas is known as mixed gland? Write the names of two important hormones released from pancreas along with their function.

24. What is the scattering of light? Explain with the help of an example. **(Physics)**

25. The voltage - current (V-I) graph of a metallic circuit at two different temperature T_1 and T_2 is shown. Which of the two temperatures is higher and why? **(Physics)**



OR

(a) What is the (i) conventional direction of electric current (ii) direction of flow of electrons?

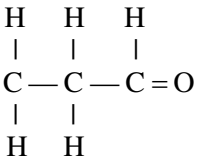
(b) A charge of 150 coulomb flows through a wire in one minute. Find the electric current flowing through it.

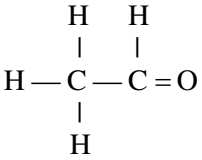
26. 'Brain and spinal cord are two vital organs of our body'. How is our body designed to protect them? **(Biology)**

SECTION-C

Q.no. 27 to 33 are short answer questions.

27. Consider the following organic compounds: **(Chemistry)**

(i)


(ii)


(a) Name the functional group present in these compounds.

(b) Write the general formula for the compounds of this functional group.

(c) Draw the structure of 4th member of this series having same functional group.

28. A reddish brown metal used in electrical wires when powdered and heated strongly turns black. When hydrogen gas is passed over this black substance, it regains its original colour. Based on this information answer the following questions: **(Chemistry)**

(a) Name the metal and the black substance formed.

(b) Write balanced chemical equations for the two reactions involved in the above information.

OR

A metal 'M' on reacting with dilute acid liberates a gas 'G'. The same metal also liberates gas 'G' when reacts with a base.

(a) Write the name of gas 'G'.

(b) How will you test the presence of this gas?

(c) Write chemical equations for the reactions of the metal 'M' with (1) dilute HCl and (2) NaOH.

29. (a) Draw a neat diagram of cross-section of leaf and label the following parts **(Biology)**

(i) Cell which is involved in photosynthesis.

(ii) Layer of cells above which cuticle is present.

(b) Write two differences between light reaction and dark reaction.

30. Give reason to justify the following **(Biology)**

(a) The existence of decomposers is essential in a biosphere.

(b) Flow of energy in a food chain is unidirectional.

(c) Ozone is useful as well as harmful. Justify this statement.

31. (a) What is Myopia? State two causes of Myopia. With the help of a labelled ray diagram show the correction of Myopia using appropriate lens.

(b) The near point of a hypermetropic eye is 1 m. Find the power of the lens required to correct this defect. Assume that near point of the normal eye is 25 cm.

32. Analyse the following observation table showing variation of image distance (v) with object distance (u) in case of a convex lens and answer the questions that follow without doing any calculations:

S.No.	Object distance u (cm)	Image distance v (cm)
1.	–100	+25
2.	–60	+30
3.	–40	+40
4.	–30	+60
5.	–25	+100
6.	–15	+120

(a) What is the focal length of the convex lens? Give reason to justify your answer.

(b) Write the serial number of the observation which is not correct. On what basis have you arrived at this conclusion?

(c) Select an appropriate scale and draw a ray diagram for the observation at S.No.2. Also find the approximate value of magnification. **(Physics)**

33. (a) Why does a ray of light passing through the centre of curvature of a concave mirror after reflection, is reflected back along the same path? **(Physics)**

(b) Name the type of mirror used in the following situations

(i) Headlights of a car.

(ii) Side/rear-view mirror of a vehicle.

Support your answer with reason.

SECTION-D

Q.no. 34 to 36 are Long answer questions.

34. Write the balanced chemical equation for the following: **(Chemistry)**

(a) Combustion of ethane.

(b) Oxidation of ethanol (in the presence of alkaline $KMnO_4$).

(c) Hydrogenation of ethene.

(d) Esterification reaction (Ethanol & Ethanoic acid).

(e) Saponification reaction (Ethyl ethanoate).

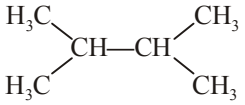
OR

(a) Draw two structural isomers of butane.

(b) Draw the structures of propanol and propanone.

(c) Name the third homologue of : (a) alkanes (b) aldehydes

(d) Name the following:

(i) 

(ii) $CH_3-CH_2CH=CH_2$

35. (a) Name the organ where sperms are produced and name the hormone produced by this organ. Why do sperms have a tail but ovum does not have it? **(Biology)**

(b) Define the term pollination. Differentiate between self-pollination and cross-pollination. What is the significance of pollination?

OR

(a) What is 'phototropism'? Describe the role of auxin in phototropism.

(b) List two vital functions of kidney.

36. (a) Derive the relation for the equivalent resistance when three resistors of resistances R_1, R_2 and R_3 are connected in parallel.

(b) Find the minimum resistance that can he made using four resistors, each of 20 Ω. **(Physics)**

OR

A household uses the following electric appliances :

(a) refrigerator of rating 400 W for 10 hours each day.

(b) two electric fans of rating 80 W each for 6 hours daily.

(c) six electric tubes of rating 18 W each for 6 hours daily.

Calculate the electricity bill for the household for month of June, if cost of electrical energy is ₹ 3.00 per unit.

SECTION-E

Q.no. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

37. The melting points and boiling points of some ionic compounds are given below: **(Chemistry)**

Compound	Melting Point (K)	Boiling Point (K)
NaCl	1074	1686
LiCl	887	1600
$CaCl_2$	1045	1900
CaO	2850	3120
$MgCl_2$	981	1685

These compounds are termed ionic because they are formed by the transfer of electrons from a metal to a non-metal. The electron transfer in such compounds is controlled by the electronic configuration of the elements involved. Every element tends to attain a completely filled valence shell of its nearest noble gas or a stable octet.

(a) Show the electron transfer in the formation of magnesium chloride. **(1)**

(b) List two properties of ionic compounds. **(1)**

(c) While forming an ionic compound say sodium chloride how does the sodium atom attain its stable configuration? **(2)**

OR

(c) Give reasons:

(i) Why do ionic compounds not conduct electricity in the solid state?

(ii) What happens at the cathode when electricity is passed through an molten solution of sodium chloride?

38. In an organism, allele responsible for the red eyes (R) is dominant over the white eyes (r). A heterozygous red eyed male mated with a white eyed female. They produce 4 progenies in which some are red eyed and some are white eyed. **(Biology)**

(a) What will be the genotype of red eyed progenies for the given cross?

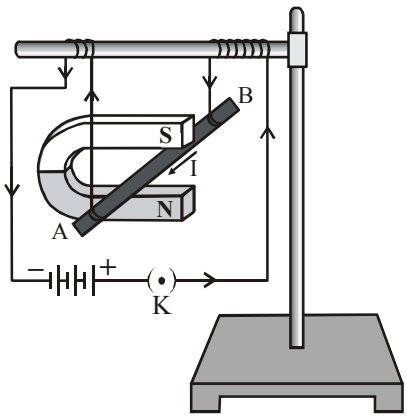
(b) What will be the ratio of red eyed progenies to white eyed progenies in the above cross?

(c) If the F_1 progenies with red eyes are selfed then what will be the ratio of their progenies that are heterozygous for red eyes?

OR

(c) If a homozygous red eyed male mated with the white eyed female then find out the genotypic and phenotypic ratio of F_2 generation.

39. A student was asked to perform an experiment to study the force on a current carrying conductor in a magnetic field. He took a small aluminium rod AB, a strong horse-shoe magnet, some connecting wires, a battery and a switch and connected them as shown. He observed that on passing current, the rod gets displaced. On reversing the direction of current, the direction of displacement also gets reversed. On the basis of your understanding of this phenomenon, answer the following questions: **(Physics)**



(a) Why does the rod get displaced on passing current through it?

(b) State the rule that determines the direction of the force on the conductor AB.

(c) (i) If the U shaped magnet is held vertically and the aluminium rod is suspended horizontally with its end B towards due north, then on passing current through the rod from B to A as shown, in which direction will the rod be displaced?

(ii) Name any two devices that use current carrying conductors and magnetic field.

OR

(c) Draw the pattern of magnetic field lines produced around a current carrying straight conductor held vertically on a horizontal cardboard. Indicate the direction of the field lines as well as the direction of current flowing through the conductor.