Roll Number	.	

SET A

INDIAN SCHOOL MUSCAT
SECOND PRE-BOARD EXAMINATION
SCIENCE

CLASS: X | Sub. Code: 086 | Time Allotted: 3 Hrs.

11.04.2021 | Max. Marks: 80

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. 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 labeled diagrams should be drawn.*

SECTION - A

1. What is the name given to corrosion of iron? Write the chemical name of that substance formed. 1

OR

Define the type of chemical reaction taking place in black and white photography

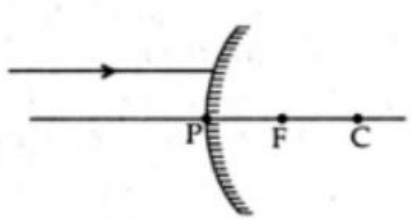
2. Choose weak acids from the following: 1
CH_3COOH , H_2SO_4 , HNO_3 , H_2CO_3

3. Ethane with the molecular formula of C_2H_6 has 1
   (a) 6 covalent bonds
   (b) 7 covalent bonds
   (c) 8 covalent bonds
   (d) 9 covalent bonds

4. What is Tyndall Effect? 1

5. In a concave mirror where should we keep the object so that image formed will be real, inverted and enlarged? 1

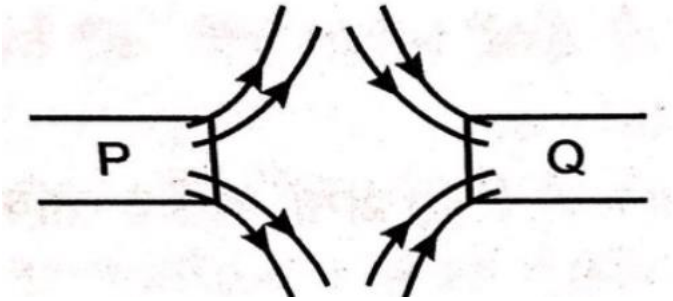
6. Redraw the diagram given below in your answer book and show the direction of the light ray after reflection from the mirror. 1



OR

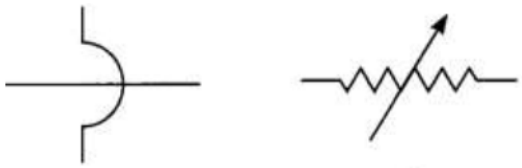
Why does a ray of light bend when it travels from one medium into another?

7. In the figure, from the magnetic field lines of two magnets identify the poles marked P and 1



8. Name the rule to determine the direction of force experienced by a current carrying straight conductor placed in a uniform magnetic field which is perpendicular to it. 1

9. What do the following circuit symbols represent? 1



(*i*) (*ii*)

OR

How is the direction of electric current related to the direction of flow of electrons in a wire?

10. Veins are thin walled and have valves. Justify 1

11. Define Peristalsis. 1

OR

In cellular respiration, where does the first step of breakdown of glucose take place? What is the three carbon molecule formed after this first step of breakdown of glucose?

12. State two differences between male and female gamete in humans. 1

OR

Name the tube that carries sperms from the testes in human males and also the common passage for urine and sperms.

13. DDT was sprayed in small amounts in certain grasslands where goats were fed. Later it was found that humans who consumed these goats showed substantial amount of DDT in their body. What was the reason for this? Explain. 1

For question numbers 14, 15 and 16, two statements are given- one labeled Assertion (A) and the other labeled Reason (R). Select the correct answer to these questions from the codes (a), (b), (c) and (d) as given below:

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.

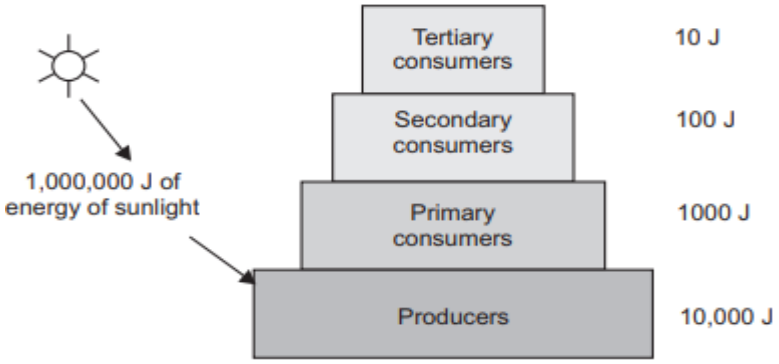
14. Assertion: The chemical reaction during which oxygen is added is called as oxidation reaction. 1
Reason: Substance which undergo oxidation is oxidising agent.

15. Assertion: Ozone is formed in the upper atmosphere by oxygen in presence of UV radiations. 1
Reason: Ozone depletion will lead to UV rays reaching earth which may cause skin cancer.

16. Assertion: Energy is used during the process of cellular respiration. 1
Reason: Respiration releases energy that is stored in the form of ATP.

Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.

17. Green plants capture 1% of the total incident sunlight and convert it into food energy. Only 10% of this energy is transferred to the next trophic level. The remaining 90% of this energy is consumed in life processes like digestion, respiration, growth, reproduction by each trophic level. The energy left beyond 4-5 trophic levels is so less that none of the food chains could go beyond that. Flow of energy in an ecosystem is unidirectional. As energy flows from lower to higher trophic levels no energy is available for previous trophic level. It flows from producer into consumer and not vice versa. Sun is the universal source of energy for all. 1x4



(i) How much of the primary productivity of plants is consumed by herbivores in a terrestrial ecosystem?

(a) 100%
(b) 10 %
(c) 1%
(d) 0.1%

(ii) In an ecosystem,10% of energy available for transfer from one trophic level to the next is in the form of:

(a) Heat energy
(b) Chemical energy
(c) Light energy
(d) Mechanical energy

(iii) In a given food chain suppose the amount of energy at the fourth Trophic level is 5 kJ, what was the energy at the producer level. Grass---Grasshopper----Frog----Snake----Hawk

(a) 5 KJ
(b) 50 KJ
(c) 500 KJ
(d) 5000 KJ

(iv) Which of the following limits the number of trophic levels in a food chain?

(a) Contaminated water
(b) Spread of a disease
(c) Decrease in Energy
(d) Polluted Air

(v) Which of the following is a natural ecosystem?

(a) Zoo
(b) Park
(c) Aquarium
(d) Forest

18. Read the following and answer any FOUR questions from 18 (i) to 18 (v) 1x4

(i) One limitation of Mendeléev's classification is that it could not assign a position to hydrogen. Hydrogen resembles alkali metals in the combination with halogens, oxygen and sulphur. On the other hand, hydrogen resembles halogens in that it exists as a diatomic molecule and it combines with metals and non-metals to form covalent compounds.

(ii) Mendeléev's classification cannot assign position to isotopes. Isotopes are an element having same atomic numbers (similar chemical properties) but different atomic mass. e.g. Isotopes of chlorine Cl-35 and Cl-37 have atomic masses 35 and 37 respectively. As they have the same atomic number 17, they possess same chemical properties. We cannot assign them different position in the periodic table simply because they have different atomic masses. As they show same chemical properties, they are placed in the same position.

(i) Hydrogen resembles alkali metals in the combination with halogens. Its compound formed with halogens will be

(a) HX
(b) HX_2
(c) H_2X
(d) H_2X_3

(ii) The atomic masses of element P and Q are 6 and 7 and their atomic number is 3

(a) Their chemical properties are same.
(b) Their chemical and physical properties both are same.
(c) Their physical properties are same.
(d) Cannot say anything about their chemical properties.

(iii) Mendeléev's classification could not assign position to

(a) Hydrogen

(b) Isotopes

(c) Hydrogen and Isotopes

(d) Hydrogen, Oxygen and Sulphur

(iv) Hydrogen resembles halogens in that it exists as a

(a) Monoatomic molecule

(b) Diatomic molecule

(c) Triatomic molecule

(d) Polyatomic molecule

(v) Hydrogen combines with metals and non-metals to form

(a) Ionic compounds

(b) Covalent compounds.

(c) Ionic and covalent compounds both

(d) Either ionic or covalent compounds

19. Different colours of light bend through different angles with respect to the incident ray, as they pass through a prism. The red light bends the least while the violet the most. Thus the rays of each colour emerge along different paths and thus become distinct. A rainbow is a natural spectrum appearing in the sky after a rain shower. It is caused by dispersion of sunlight by tiny water droplets, present in the atmosphere. A rainbow is always formed in a direction opposite to that of the Sun. Colour of the sky is due to scattering of light in the atmosphere. Another interesting phenomenon is Stars twinkle and while Planets do not twinkle 1x4

(i) When white light enters a glass prism from air, the angle of deviation is least for

(a) blue light

(b) yellow light

(c) violet light

(d) red light

(ii) Twinkling of stars is due to

(a) reflection of light by clouds

(b) scattering of light by dust particles

(c) dispersion of light by water drops

(d) atmospheric refraction of starlight

(iii) Which of the following is a natural phenomenon which is caused by the dispersion of sunlight in the sky?

(a) Twinkling of stars

(b) Stars seem higher than they actually are

(c) Advanced sunrise and delayed sunset

(d) Rainbow

(iv) At noon, the Sun appears white as

(a) blue colour is scattered the most

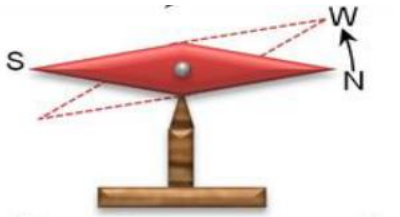
(b) red colour is scattered the most

(c) light is least scattered

(d) all the colours of the white light are scattered away

(v) When white light enters a prism, it gets split into its constituent colours. This is due to
(a) different refractive index for different wavelength of each colour
(b) each colours has same velocity in the prism.
(c) prism material have high density.
(d) Scattering of light

20. When the current flows through a conductor from South to North then the magnetic needle placed beneath it, gets averted to the west, thereby proving that the flow of electric current produces a magnetic field. This is because the compass needles work as a small bar magnet, so when this magnetic needle is brought near another magnetic property surrounding then the like poles will repel, thereby the needle gets deflected. 1x4



Magnetic compass needle

(i) Which of the following statement is not correct about the magnetic field?
(a) Magnetic field lines form a continuous closed curve.
(b) Magnetic field line do not intersect each other.
(c) Direction of tangent at any point on the magnetic field line curve gives the direction of magnetic field at that point.
(d) Outside the magnet, magnetic field lines go from South to North pole of the magnet.

(ii) Relative strength of magnetic field at a point in the space surrounding the magnet is shown by the
(a) length of magnet
(b) thickness of magnet
(c) degree of closeness of the field lines.
(d) resistance offered by the surroundings

(iii) Magnetic effect of current was discovered by
(a) Oersted (b) Faraday (c) Bohr (d) Ampere

(iv) The pattern of the magnetic field produced by the straight current carrying conducting wire is
(a) in the direction opposite to the current
(b) in the direction parallel to the wire
(c) circular around the wire
(d) in the same direction of current

(v) The strength of magnetic field around a current carrying conductor is
(a) inversely proportional to the current but directly proportional to the square of the distance from wire.
(b) directly proportional to the current and inversely proportional to the distance from wire.
(c) directly proportional to the distance and inversely proportional to the current
(d) directly proportional to both the current and the square of the distance from wire.

SECTION – B

21. Bile juice does not have any digestive enzyme but still plays a significant role in digestion. State two important functions of Bile. 2

OR

In Birds and mammals the right and left side of heart are separated. How and why is it so?

22. What is blood pressure? Give one difference between systolic pressure and diastolic pressure 2

23. What would be the electron dot structure of carbon dioxide which has the formula CO_2 and methane which has the formula CH_4? 2

OR

Write the name and structural formula of the 2^{nd} and 3^{rd} member of homologous series having general formula of CnH_2n

24. Bhawna took a pale green substance A in a test tube and heated it over the flame of a burner. A brown-coloured residue B was formed along with evolution of two gases with burning smell of sulphur. Identify A & B. Write the chemical reaction involved. 2

25. Explain why do the planets not twinkle but the stars twinkle. 2

26. A piece of wire of resistance 20 Ω is drawn out so that its length is increased to twice its original length. Calculate the resistance of the wire in the new situation. 2

SECTION – C

27. What are two different ways in which glucose is oxidised to provide energy in various organisms? Explain in brief 3

OR

(a) Draw the structure of a nephron and label the following on it: Glomerulus, Bowman's capsule
(b) What happens to glucose that enters the nephron along with filtrate?

28. We cross pure-bred tall (dominant) pea plant (TT) with pure-bred dwarf (recessive) (tt) pea plant. If we now self-pollinate the pea plants of F1 generation, then we obtain F2 generation. 3
(a) What do all plants of F1 generation look like? Show the cross from parent to F2 generation.
(b) State the genotypic and Phenotypic ratio of tall plants to dwarf plants in F2 generation.
(c) What is the ratio of pure Tall and pure dwarf in F2 generation

29. Name the following: 3
(a) Thread like non-reproductive structures present in Rhizopus.
(b) Mode of asexual reproduction in Planaria
(c) Unicellular Organism in which a cell divides multiple times giving rise to many daughter cells.

30. (a) Give one example each for saturated and unsaturated hydrocarbons. 3
(b) Select alkenes and alkynes from the following:
C_2H_4 , C_3H_4 , C_2H_2, C_4H_8

(c) Draw the structure of hydrocarbons with general formula C_nH_{2n-2}, where n = 3.

31. In the formation of a compound XY_2, atom X donates one electron to each Y atom. Show the electron dot structure of X and Y and the formation of XY .What is the nature of bond in XY_2? Write any two properties of compound XY_2 3

32. The position of three elements A, B and C in the Periodic Table is shown below: 3

Group 16	Group 17
-	-
-	A
-	-
B	C

Giving reasons, explain the following:
(a) Element A is a non-metal.
(b) Element B has a larger atomic size than element C.
(c) Element C has a valency of 1

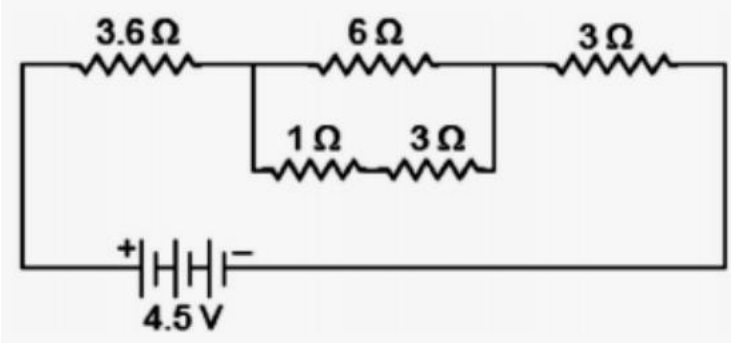
33. Draw the ray diagram in each case to show the position and nature of the image formed when the object is placed: 3
(a) between the focus and optical centre of a convex lens
(b) between infinity and optical centre of a concave lens

SECTION – D

34. (a) Write relation between heat energy produced in a conductor when a potential difference V is applied across its terminals and a current I flows through for time 't' 5
(b) What happens to resistance of a conductor when its area of cross-section is increased?
(c) Draw a schematic diagram of an electric circuit consisting of a battery of five 2 V cells, a 20 Ω resistor, a 30 Ω resistor, a plug key, all connected in series. Calculate the value of current flowing through the 20 Ω resistor and the power consumed by the 30Ω resistor.

OR

(a) State difference between the wire used in the element of an electric heater and in a fuse wire.
(b) Find the current flowing through the following electric circuit.



35. (a) Define an acid and a base. Give one example each. 5

(b) Give the names and formula of one strong base and one weak base

(c) What type of ion is formed when:

(i) An acid is dissolved in water.

(ii) A base is dissolved in water

(d) Write the neutralization reaction between acids and bases (balance the equation)

(e) Differentiate between weak acid and dilute acids

OR

Equal length of magnesium ribbon is taken in two test tubes A and B. H_2SO_4 is added to test tube A and H_2CO_3 in the test tube B in equal amounts:

(a) Identify the test tube showing vigorous reaction.

(b) Give reason to support your answer.

(c) Name the gas liberated in both the tubes. How will you prove its liberation?

(d) Write chemical equations for both reactions.

(e) Out of the two acids taken above which one will have

(i) lower pH value

(ii) lower H^+ concentration respectively

36. (a) Draw labelled diagram of a L.S. of a flower labelling the following parts:- 5

Stigma, Anther, Ovary

(b) Where are human testis located in the male body and why?

(c) State the function of placenta in human female reproductive system.

(d) State one reason why frequent pregnancies should be avoided.

End of the Question Paper