

INDIAN SCHOOL AL WADI AL KABIR

SAMPLE PAPER 3

Class X Science (086) Theory

Time: 3 Hours

Maximum Marks: 80

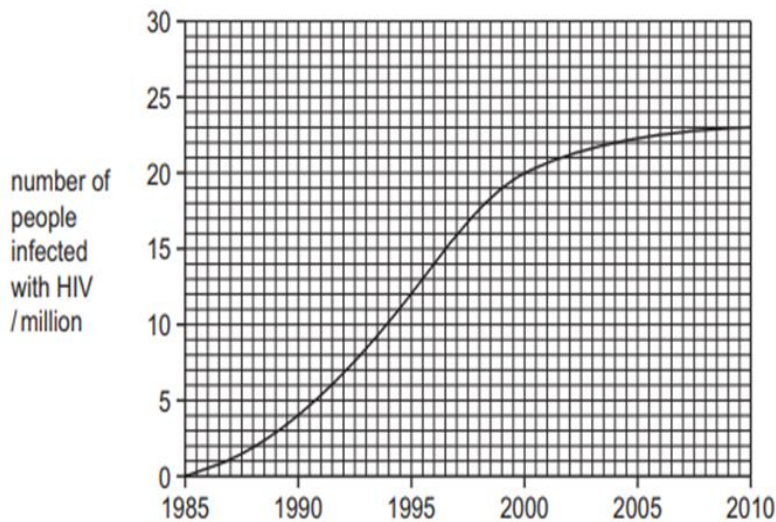
General Instructions:

- (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 be 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 be 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		
No.	Questions	Marks
1	Select saturated hydrocarbons from the following: C ₃ H ₆ , C ₄ H ₁₀ , C ₃ H ₄ , C ₆ H ₁₄ , C ₅ H ₁₀ <p style="text-align: center;">OR</p> Define catenation	1
2	How does the tendency of the elements to lose electrons change in the Modern Periodic Table in (i) a group (ii) a period?	1
3.	Which of the following is not observed in homologous series? (a) Change in chemical properties (b) Difference in -CH ₂ and 14 u difference between the consecutive members (c) Gradation in physical properties (d) Same functional group	1
4	Why are danger signals red in colour?	1
5	If the image formed by a spherical mirror for all positions of the object placed in front of it is always erect and diminished, what type of mirror is it?	1
6	An object is placed at a distance of 0.25 m in front of a plane mirror. What will be the distance between the object and image? <p style="text-align: center;">OR</p> An object at a distance of 30 cm from a concave mirror gets its image at the same point. What is the focal length of the mirror?	1

7	What happens to the deflection in the magnetic compass needle when we move away from a straight current carrying conductor?	1
8	What type of magnetic field is observed at the centre of circular loop carrying current?	1
9	Five equal resistors of resistances 50Ω are connected in parallel. What is its equivalent resistance?	1
10	Rearrange the following according to their ascending trophic level in a food chain: Hawk, Grass, Snake, Rabbit.	1
11	What is a gene?	1
12	Name the organelle in which photosynthesis occurs. OR Name the pigment present in plants which can absorb solar energy.	1
13	Why do testes in mammals descend into the scrotum? OR Write dual purposes served by the urethra.	1
<p>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:</p> <p>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.</p>		
14	Assertion: Chemical bonds in carbon compounds are covalent in nature Reason: Covalent bond is formed by the sharing of electrons	1
15	Assertion: Energy is used during the process of respiration. Reason: Respiration stores energy in the form of ATP.	1
16	Assertion: The muscular wall of the right ventricle is thicker than the left ventricle. Reason: This helps in preventing the back flow of blood. OR Assertion: Excretory unit of kidney is nephrons Reason: It has no role in the secretion of urine.	1
<p>Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.</p>		
17	<p><u>Read the following and answer any four questions from 17 (i) to 17 (v)</u></p> <p>Modern periodic table has 18 vertical columns called groups and 7 horizontal rows called periods. First period contains 2 elements, second and third period contains 8 elements fourth and fifth period contains 18 elements and sixth and seventh period contains 32 elements. The below given graph is plotted between the atomic number of group 1 and 17 elements and atomic radius of the elements.</p>	(1x4)

17(i)	<p>Which of the following has lowest electronegativity?</p> <p>a) Cs b) Br c) Na d) Cl</p>	
17(ii)	<p>Which among the following groups will have largest atomic radii?</p> <p>a) Group 17 b) Group 15 c) Group 2 d) Group 1</p>	
17(iii)	<p>Which of the following will accept electron easily?</p> <p>a) F b) Cl c) Br d) I</p>	
17(iv)	<p>What happens to the atomic radii on moving from top to bottom in a group?</p> <p>a) Increases b) Decreases c) Increases and then decreases d) Decreases and then increases</p>	
17(v)	<p>Which element has the highest electronegativity?</p> <p>a) Cl b) I c) Na d) F</p>	
18	<p><u>Read the following and answer any four questions from 18 (i) to 18 (v)</u></p> <p>The graph shows the number of people infected with HIV, in one part of the world, between 1985 and 2010.</p>	(1x4)



While HIV is a virus that may cause an infection, AIDS (which is short for acquired immunodeficiency syndrome) is a condition. Contracting HIV can lead to the development of AIDS. Compared with other types of viruses, such as influenza or chicken pox, HIV is relatively fragile. It does not thrive at room temperature (68 degrees F), when exposed to ultraviolet (UV) radiation from the sun, or at pH levels that are dissimilar to that of blood. Even if a small amount of virus does manage to survive for a short period of time, the odds that it will infect you are next to zero.

18(i)

Using data from the graph, which statement is correct?

- a) Between 1995 and 2000 the number of people infected with HIV increased by 67%.
- b) Between 1995 and 2000 the number of people infected with HIV increased by 20%.
- c) Between 1990 and 1995 the number of people infected with HIV doubled.
- d) Between 1995 and 2000 the number of people infected with HIV doubled.

18(ii)

Antibiotics are used to treat some diseases. Which diseases could they be effective against?

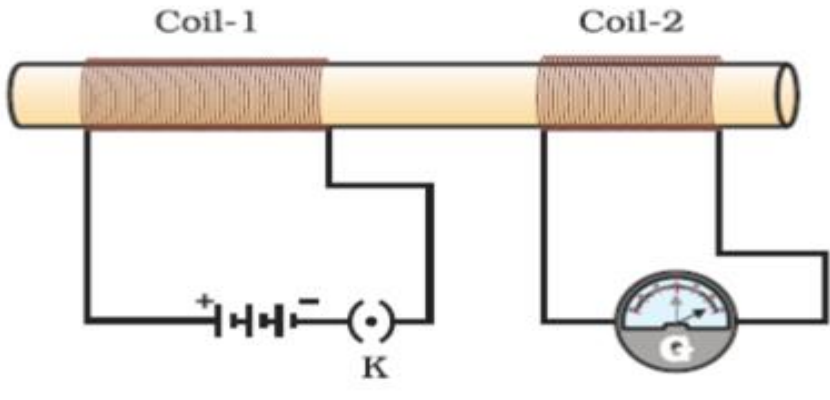
	bacterial infection	HIV	scurvy
A	✓	✓	✓
B	✓	x	✓
C	✓	x	x
D	x	✓	x

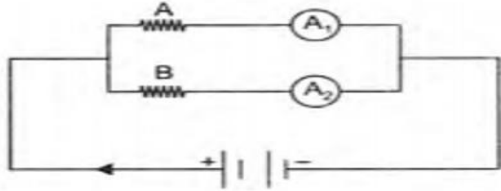
18(iii)

What is the difference between HIV and AIDS?

- a) AIDS is a virus and HIV is the advanced stage of infection
- b) HIV is a virus and AIDS is the advanced stage of infection
- c) AIDS is a bacteria and HIV is the advanced stage of infection
- d) HIV is a bacteria and AIDS is the advanced stage of infection

18(iv)	What are the chances of infection from HIV virus, if the virus survives outside the body for a short period of time. a) 10% b) 01% c) 100% d) 00%																																					
18(v)	Which of the most fragile of the following viruses a) Influenza b) Chicken pox c) Small pox d) D) HIV																																					
19	Read the following and answer any four questions from 19 (i) to 19 (v)	(1x4)																																				
	<table border="1"> <thead> <tr> <th>Material medium</th> <th>Refractive index</th> <th>Material medium</th> <th>Refractive index</th> </tr> </thead> <tbody> <tr> <td>Air</td> <td>1.0003</td> <td>Canada Balsam</td> <td>1.53</td> </tr> <tr> <td>Ice</td> <td>1.31</td> <td>Rock salt</td> <td>1.54</td> </tr> <tr> <td>Water</td> <td>1.33</td> <td>Carbon disulphide</td> <td>1.63</td> </tr> <tr> <td>Alcohol</td> <td>1.36</td> <td>Fused quartz</td> <td>1.46</td> </tr> <tr> <td>Kerosene</td> <td>1.44</td> <td>Dense flint glass</td> <td>1.65</td> </tr> <tr> <td>Turpentine oil</td> <td>1.47</td> <td>Ruby</td> <td>1.71</td> </tr> <tr> <td>Benzene</td> <td>1.50</td> <td>Sapphire</td> <td>1.77</td> </tr> <tr> <td>Crown glass</td> <td>1.52</td> <td>Diamond</td> <td>2.42</td> </tr> </tbody> </table>	Material medium	Refractive index	Material medium	Refractive index	Air	1.0003	Canada Balsam	1.53	Ice	1.31	Rock salt	1.54	Water	1.33	Carbon disulphide	1.63	Alcohol	1.36	Fused quartz	1.46	Kerosene	1.44	Dense flint glass	1.65	Turpentine oil	1.47	Ruby	1.71	Benzene	1.50	Sapphire	1.77	Crown glass	1.52	Diamond	2.42	
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19(i)	Find out from the given table, the medium having highest optical density. a) Diamond b) Air c) Ice d) Crown glass																																					
19(ii).	As light travels from a rarer medium to a denser medium it will have a) Increased velocity b) Decreased velocity c) Decreased wavelength No change in wavelength																																					
19(iii).	You are given kerosene, turpentine, rock salt and water. In which of these does the light travel fastest? (a)Rock salt (b) Water (c) Kerosene (d) turpentine																																					
19(iv).	Find ratio of the speed of light in benzene to that of dense flint glass.																																					

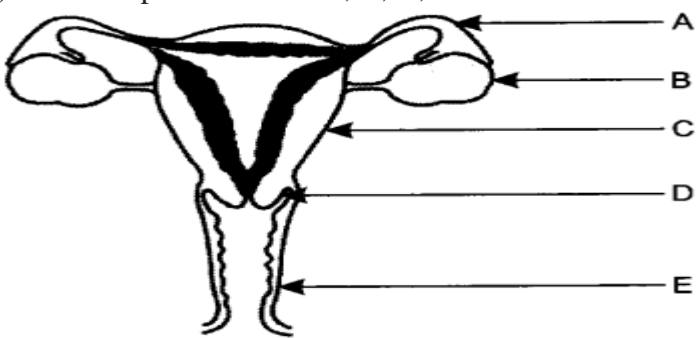
	(a) 0.909 (b) 0.18 (c) 1.25 (d) 1.1	
19(v).	What is the relative refractive index of Diamond with respect to Ruby? (a) 1.92 (b) 1.41 (c) 0.706 (d) 0.941	
20	<p>Read the following and answer any four questions from 20 (i) to 20 (v)</p> <p>The space surrounding the magnet in which magnetic force is exerted is called magnetic field. Magnetic field can be produced by current carrying conductor. The direction of magnetic field lines at a place can be determined by a compass needle.</p> <p>Electric current can be produced using magnetic field also. Look at the diagram given below and answer the following.</p> 	(1x4)
20(i)	Which phenomenon is explained using this activity? (a)Magnetic effects of electric current (b)Heating effect of electric current (c)Diffraction (d)Electromagnetic induction	
20(ii)	A Galvanometer (a) Measures current (b) Measures potential difference (c)Detects the presence of current (d)Provides potential difference	
20(iii)	Coil 1 and coil 2 are respectively known as (a) Secondary coil and Primary coil (b)Primary coil-1 and primary coil 2 (c)Secondary coil-1 and secondary coil-2 (d)Primary coil and secondary coil	
20(iv)	Direction of induced current is given by (a)Fleming's Right-Hand Rule (b)Fleming's Left-Hand Rule (c)Right Hand Thumb Rule (d)Maxwell's cork screw Rule	
20(v)	What happens in the galvanometer when the key is switched off? (a)Galvanometer does not show any deflection (b)Galvanometer shows deflection towards both the sides. (c)Galvanometer shows a momentary deflection to one side.	

	(d)Galvanometer shows a deflection towards one side and remains in the deflected position.											
SECTION B												
21	What is a rainbow and how is it formed?	2										
22	In the circuit diagram shown, the two resistance wires A and B are of the same length and same material, but A is thicker than B. Which ammeter A1 or A2 will indicate higher reading for current? Give reason. 	2										
23	Write the molecular formula of Ethene and draw its molecular structure OR Compare the ability of catenation of Carbon and silicon giving the reason for the trend.	2										
24	Given below are four elements with their atomic numbers. <table border="1" data-bbox="571 907 1029 1097"> <thead> <tr> <th>Element</th> <th>Atomic number</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>16</td> </tr> <tr> <td>B</td> <td>11</td> </tr> <tr> <td>C</td> <td>3</td> </tr> <tr> <td>D</td> <td>14</td> </tr> </tbody> </table> a) Identify the elements which belong to the same group b) Write the formula of oxide B c) Out of A, B and D which has the largest atomic size? d) Which of the element is a metalloid?	Element	Atomic number	A	16	B	11	C	3	D	14	2
Element	Atomic number											
A	16											
B	11											
C	3											
D	14											
25	Show by a series of labelled sketches, the manner in which reproduction occurs in Amoeba.	2										
26	Why is transpiration considered a necessity for better ascent of sap? OR Differentiate between saprophyte and parasite.	2										
SECTION C												
27	An object 2 cm in size is placed 30 cm in front of a concave mirror of focal length 15 cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image? Draw the ray diagram for the image formation.	3										
28	P, Q and R are three elements which undergo chemical reaction as follows $P_2O_3 + 2Q \longrightarrow Q_2O_3 + 2P$ $3RSO_4 + 2Q \longrightarrow Q_2(SO_4)_3 + 3R$ $3RO + 2P \longrightarrow P_2O_3 + 3R$ Answer the following questions with reasons a. Which element is the most reactive? b. Which element is least reactive? State the type of reactions involved	3										
29	(a) Name one element that have a single electron in their outermost shells (b) Name one element that have complete octet	3										

	(c) Name the element having electronic configuration 2,8,3	
30	(a) Arrange the following metals in an increasing order of their reactivity towards water: Zinc, Iron, Magnesium, Sodium (b) Name one metal more reactive and another less reactive than hydrogen (c) Name one metal which displaces silver from silver nitrate solution and one which do not.	3
31	Draw a labelled diagram of the detailed structure of a nephron.	3
32	Explain with the help of an example how trait is inherited in human beings.	3
33	What are the male and female gonads in human beings? State any two functions of each of them. OR Name the radiation absorbed by ozone layer. Give the main cause of the depletion of the ozone layer. Name the disease likely to be caused due to depletion.	3

SECTION D

34	<p>(a) State the law which shows the dependence of current with potential difference.</p> <p>(b) Write the symbols used in electric circuits to represent</p> <p style="padding-left: 20px;">(i) Rheostat</p> <p style="padding-left: 20px;">(ii) A battery of three cells.</p> <p>(c) Draw the V-I graph for ohmic conductors.</p> <p>(d) Consider the following circuit diagram. If $R_1 = R_2 = R_3 = R_4 = R_5 = 3\Omega$, find the equivalent resistance of the circuit.</p> <div style="text-align: center;"> </div> <p style="text-align: center;">OR</p> <p>a) Draw a circuit diagram which consists of a bulb, a battery of two cells, a closed key, a voltmeter and an ammeter.</p> <p>b) Find the resistance of the bulb if each cell provides 2 V and the ammeter shows a reading of 0.4A.</p> <p>c) How can you find the resistance of the circuit with the help of a V-I graph?</p> <p>d) Two students perform the experiments on series and parallel combinations of two given</p> <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;"> <p>A</p> </div> <div style="text-align: center;"> <p>B</p> </div> </div>	5
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	Which of the two diagrams correctly represents the V-I graph for series and parallel combinations? Give reason.	
35	<p>(a) How does metallic character of elements in Modern Periodic Table vary on moving from –</p> <p>(i) left to right in a period?</p> <p>(ii) top to bottom in a group? Explain with the help of an example in each case.</p> <p>(b) If an element X is placed in group 14, what will be the nature of bond in its chloride? Write the chemical formula of the compound formed.</p> <p>(c) An element X has mass number = 35 and number of neutrons = 18. What is the atomic number of X? Write electronic configuration of X and determine its valency.</p> <p style="text-align: center;">OR</p> <p>(a) Define atomic size.</p> <p>(b) In the modern periodic table what trend is observed in the atomic radius in a group and a period and why is it so?</p>	5
36	<p>(a) Name the parts labelled A, B, C, D and E.</p>  <p>(b) Where do the following functions occur?</p> <p>(i) Production of an egg</p> <p>(ii) Fertilisation</p> <p>(iii) Implantation of zygote.</p> <p>(c) What happens to the lining of uterus:</p> <p>(i) before release of a fertilised egg?</p> <p>(ii) if no fertilisation occurs?</p>	5

Prepared by : The Department of Science 2020 -21

Checked by : HOD – SCIENCE