INDIAN SCHOOL AL WADI AL KABIR

SAMPLE PAPER 1

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 in the range of 30 to 50 words.*

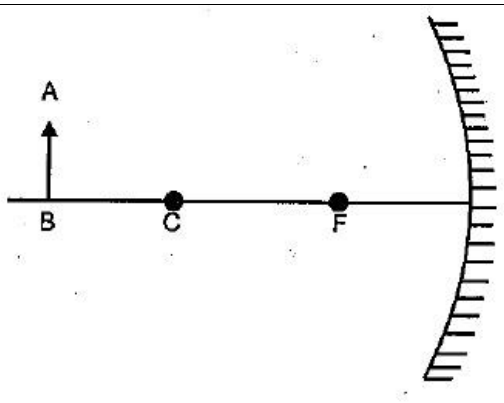
(iv) *Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should in the range of 50 to 80 words.*

(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		
No.	Questions	Marks
1	What is the magnification produced if an object is placed at the centre of curvature of a concave mirror?	1
2	Name two devices which work on Joule's law of heating.	1
3.	What is the minimum resistance that can be made using four resistors each of 20Ω? OR How many 10Ω resistors are to be connected in parallel to obtain equivalent resistance of 2.5 Ω?	1
4	The refractive index of three media A, B & C are 1.51, 1.65 & 1.33 respectively. Arrange the media in the increasing order of speed of light in the media. OR The refractive index of three media A, B & C are 1.51, 1.65 & 1.33 respectively. Arrange the media in the increasing order of bending of light in the media.	1
5	In the spectrum of white light which colour is getting a) least deviated and b) most deviated?	1
6	Complete the ray diagram and show the position of the image	1

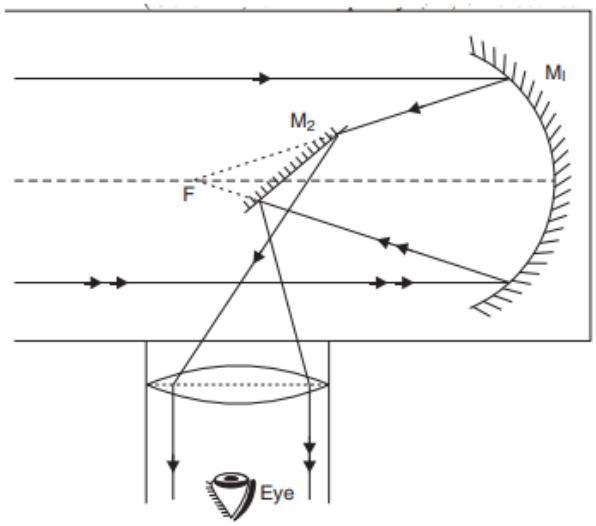
		
7	List any two observations when Fe rod is dipped in Copper sulphate solution OR List any one observation when Zinc granules are added to dilute HCl solution. Account for the observation.	1
8	Write the chemical name and chemical formula of Baking soda.	1
9	List two natural ecosystems.	1
10	Name any two parts of a bisexual flower that are not directly involved in reproduction.	1
11	What is the role of the acid in our stomach? OR What is the significance of emulsification of fats?	1
12	What is fertilisation? Where does it occur in human female? OR What Happens to a mature spirogyra filament when it gains favourable length?	1
13	A dilute solution of Sodium carbonate is added to two test tubes. One containing dilute HCl (A) and the other containing dilute NaOH (B). The correct observation was (a) A brown coloured gas liberated in test tube (A) (b) A brown coloured gas liberated in test tube (B) (c) A colourless gas liberated in test tube (A) (d) A colourless gas liberated in test tube (B)	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**: Sodium metal is stored under kerosene. **Reason**: Sodium metal melts when exposed to air.	1
15	**Assertion:** Double fertilisation is a unique phenomenon in angiosperms. **Reason:** Triple fusion occurs in both fertilisations. OR **Assertion**: Surgical methods are the most effective methods of contraception.	1

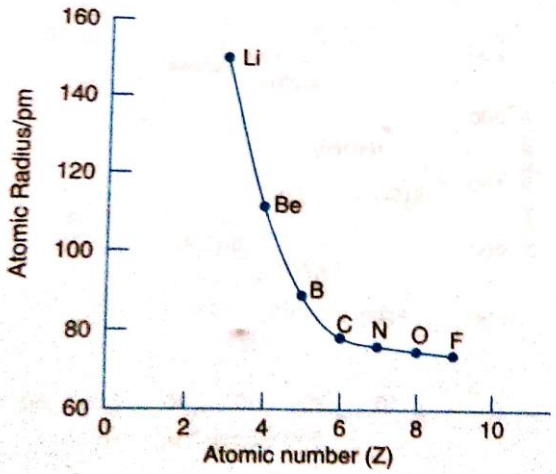
	Reason: Surgical methods block the gametes transport and hence prevent fertilisation.	
16	**Assertion:** Lipases help in the emulsification of fats. **Reason:** Lipases hydrolyses fats and oils.	1
Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.		
17	Read the following and answer any **four** questions from 17 (i) to 17 (v)	(1x4)

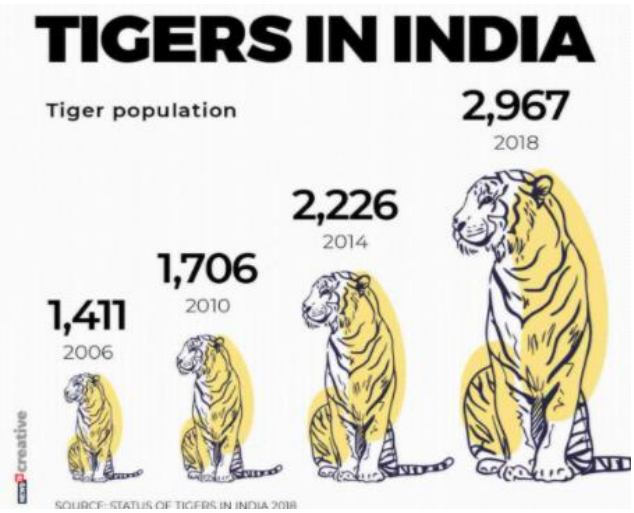
Conductor Material	Resistivity (Ohm meters @ 20 °C)
Silver	1.64×10^{-8}
Copper	1.72×10^{-8}
Aluminum	2.83×10^{-8}
Tungsten	5.50×10^{-8}
Nickel	7.80×10^{-8}
Iron	12.0×10^{-8}
Constantan	49.0×10^{-8}
Nichrome II	110×10^{-8}

We come across large number of electrical devices in our daily life. Each one has different properties and uses. Different appliances make use of different materials given in the table above. Go through the table and answer the following.

17(i)	Which substance is used in electrical transmission lines and why? (a)Nickel due to its high resistivity. (b)Nichrome due to its high resistivity. (c)Silver due to its low cost. (d)Copper due to its high conductivity.	
17(ii)	What is the resistance of a tungsten wire of length 2m and area of cross section $1cm^2$? (a)$22 \times 10^{-2}\ \Omega$ (b)$22 \times 10^{-4}\ \Omega$ (c)$11 \times 10^{-4}\ \Omega$ (d)$11 \times 10^{4}\ \Omega$	
17(iii)	Which of these substances is used as electrical heating device and why? (a)Nichrome due to its high resistivity. (b)Copper due to its high conductivity. (c)Nickel due to its high resistivity. (d)Tungsten due to its high conductivity.	
17(iv)	A constantan wire of length 'l' and area of cross section A is drawn to double its length, what will be the value of new resistivity of the wire? (a)Resistivity gets doubled. (b)Resistivity remains the same. (c)Resistivity gets halved.	

	(d)Resistivity becomes four times.	
17(v)	What are the factors on which resistivity of a wire depends on? (a)Length and area of cross section. (b)Length and nature of the material. (c)Area of cross section and temperature. (d)Nature of the material and temperature.	
18	Read the following and answer any **four** questions from 18 (i) to 18 (v **)**  A telescope is an optical instrument using lenses, curved mirrors or a combination of both to observe distant objects. The first known practical telescopes were refracting telescopes using glass lenses. Another type of telescope is a reflecting type telescope which uses mirrors to collect and focus light. The figure above shows a reflecting type telescope. Observe the diagram and answer the following.	(1x4)
18(i)	Name the types of mirror used in the telescope. (a) Convex mirror and concave mirror (b) Plane mirror and convex mirror (c)Concave mirrors (d)Plane and concave mirror.	
18(ii)	What is the focal length of the lens used here if the power of the lens is 2D? (a) 2m (b) 0.5m (c) 5m (d) 0.2m	
18(iii)	If the magnification produced by the mirror used is -0.3. What is the nature and the size of the image formed? (a) Real and magnified (b) Real and diminished (c) Virtual and magnified (d) Virtual and diminished	
18(iv)	The image distance of which kind of device is always negative according to sign convention? (a) Concave lens (b) Convex lens (c) Concave mirror	

	(d) Convex mirror	
18(v)	An object is placed in front of a convex lens of focal length 20 cm. The distance of the object from the lens is 30 cm. Find the position and magnification of the image. (a) 60 cm and -2 (b) – 60 cm and -2 (c) 60 cm and +2 (d) 30 cm and -1	
19	Read the following and answer any **four** questions from 19 (i) to 19 (v **)** The non-metallic character of an element is directly related to the electronegativity while the metallic character is inversely related to it. The electro negativity is in turn related to the atomic size.  **Fig. 3.8.** Variation of atomic radius with atomic number across the second period.	(1x4)
19(i)	The element with maximum electronegativity from second period is (a) Fluorine (b) Oxygen (c) Nitrogen (d) Lithium	
19(ii).	Which of the following correctly represents the order of metallic nature of the elements shown in the diagram (a) Boron>Carbon>Nitrogen>Lithium (b) Lithium>Nitrogen>Carbon>Boron (c) Lithium>Beryllium>Boron>Carbon (d) Fluorine>Oxygen>Nitrogen>Carbon	
19(iii).	The electronegativity generally increases with (a) Decrease in nuclear charge (b) Increase in atomic mass (c) Decrease in atomic size (d) Increase in atomic number	
19(iv).	The element with the most non-metallic character from the following in period two is	

	(a) Lithium (b) Fluorine (c) Carbon (d) Beryllium	
19(v).	Identify the reason for the gradual change of non-metallic nature along the period (a) Electronegativity increases along the period due to increase in atomic size (b) Electronegativity decreases along the period due to increase in atomic size (c) Electronegativity increases along the period due to decrease in atomic size (d) Electronegativity increases along the period due to decrease in effective nuclear charge	
20	Read the following and answer any **four** questions from 20 (i) to 20 (v **)**  We've known tigers are the king of the jungle — an apex predator. True to storybooks, tigers are important animals — crucial to the health and diversity of an ecosystem. Their place at the top of the food chain keeps the population of wild large mammals in check, maintaining the balance between herbivores like deer and the vegetation they feed on, like forests. Tigers, therefore, are an excellent indicator of how healthy an ecosystem is. Declining tiger numbers or the threat of its extinction indicated that the ecosystem isn't protected enough, and probably won't survive for much longer.	(1x4)
20(i)	According to the data provided the tiger population shows- (a) A constant decline since 2006 to 2018. (b) A constant stagnation since 2006 to 2018. (c) A constant incline since 2006 to 2018. (d) Options (a) and (c) both are correct.	
20(ii)	Why is tiger called the apex predator? (a) It is at the top of the food chain. (b) It is at the bottom of the food chain. (c) It is a carnivorous animal nothing to do with food chain. (d) It is an omnivorous animal nothing to do with food chain	
20(iii)	What is the importance of tiger in the forest?	

	(a) They are king of the jungle. (b) They are dominate all other animals of the jungle. (c) They keep in check the population of large mammals like deer in check in the jungle. (d) They guard their territory by keep a strict watch on the jungle.	
20(iv)	Why was there a decline in the population of tigers in the India? (a) The Indian climate changed thereby reducing the population. (b) There was not enough prey left in the jungles thereby reducing their population. (c) There was enough prey in the jungle but the tigers were not able to hunt them. (d) This was due to extensively hunting and pouching which led to reduced population.	
20(v)	'Presence of tiger is an excellent indicator of a healthy ecosystem'. Why? (a) Because the tigers cure the health of animals of the jungle. (b) Because the animals of prey cure the health of the tiger. (c) Because the tigers exert a control on the large herbivore mammals, and maintaining a balance between the herbivores and the producers. (d) Because the tigers do not exert a control on the large herbivore mammals, and maintaining a balance between the herbivores and the producers.	
	SECTION B	
21	Define Tyndall effect and give one example	2
22	State the laws of refraction of light	2
23	A white chemical compound becomes hard on mixing with proper amount of water. It is also used to correct the position of the fractured bones. Name the chemical compound and write its chemical formula. Write the chemical equation to show what happens to this compound when proper amount of water is mixed with this compound. **OR** Two solutions A and B have their pH values 10 and 5 respectively. Which of these will turn A) Blue litmus solution red B) Phenolphthalein from colourless to pink Justify your reason in both the cases.	2
24	A compound Z is formed by the transfer of electrons from the metal X to Non-metal Y. List any two properties of the compound Z.	2
25	Mention the post fertilisation changes in zygote, ovule, ovary and petals	2
26	What is the basic filtration unit of the kidney called? How is the amount of urine produced regulated? OR "The length of small intestine in cows is longer than the lions". Justify the statement.	2
	SECTION C	
27	Give reasons i) Blue colour of the sky. ii) Planets don't twinkle. iii) Dispersion is not observed when the light ray passes through the glass slab.	3

28	A small quantity of silver chloride is kept in the sunlight in a china dish for about half an hour. (i) State the change you would observe in the colour of Silver chloride (ii) Write balanced chemical equation for the reaction taking place in this case	3
29	An element X belongs to 3rd period and group 16 of the modern periodic table. a. Determine the number of valence electrons and valency of X b. Molecular formula of the compound when X reacts with Hydrogen c. Name the element X and state whether it is metallic or non-metallic	3
30	When a metal X reacts with cold water, it gives a basic compound Y with the molecular formula XOH (Molecular mass 40 u) and liberates a gas Z which easily catches fire. Identify X, Y and Z. Give the chemical equation for the reaction.	3
31	What are the different ways in which glucose is oxidised to provide energy in various organisms?	3
32	(i) In the following food chain, plants provide 500J of energy to the rats. How much energy will be available to hawks from snakes? (ii) List any two ways to protect Ozone layer.	3
33	How does aerobic respiration differ from anaerobic respiration? OR Write three points of differences between arteries and veins.	3
	SECTION D	
34	a) Derive an expression for equivalent resistance of three resistors in parallel with the help of a circuit diagram. b) How can three resistors each of resistance 6Ω be connected to give a total resistance of (i) 2 Ω (ii) 9Ω ? OR a) State Joules law of heating and derive an expression for it. b) Two lamps, one rated 60W at 220 V and the other 40 W at 220V, are connected in parallel to the electric supply at 220 V. (i) Draw a circuit diagram to draw the connections. (ii) Calculate the total current drawn from the electric supply.	5
35	(i)State the chemical properties on which the following uses of baking soda are based. (a) As an antacid (b) As a soda acid fire extinguisher (c) To make bread and cake soft and spongy (ii) How is washing soda obtained from baking soda? Write the relevant balanced chemical equation. **OR** Dry pellets of a base X when kept in open absorbs moisture and turns sticky. The compound X is also formed by Chlor- alkali process. (a) Write the chemical name and formula of X. (b) Describe the Chlor-alkali process with the help of a chemical equation.	5

	(c) Name the type of reaction that occurs when X reacts with dilute HCl (d) While diluting an acid, why is it recommended that the acid should be added to water and not water to the acid.	
36	(a)Draw a sectional view of human female reproductive system and label the parts where (i) eggs develop (ii) male gametes are deposited (iii) fertilised eggs get implanted. (b) Describe in brief the changes that the uterus undergoes: (i) to receive the zygote (ii) if the zygote is not formed.	5

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