

Sample Question Paper

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.

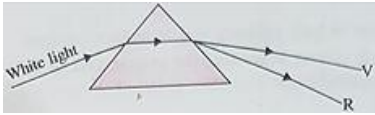
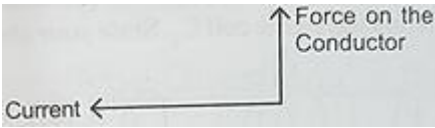
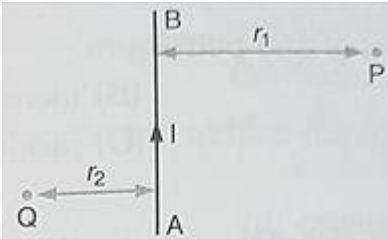
(iv) Section–C - question no. 27 to 33 are short answer type questions, carrying 3 marks each. Answers to these questions should be in the range of 50 to 80 words.

(v) Section–D – question no. - 34 to 36 are long answer type questions carrying 5 marks each. Answers 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.

No	Question	Marks
<u>SECTION A</u>		
1.	A copper wire dipped in silver nitrate solution looks silver in appearance after sometime. What could be the possible reason for such a change ? OR State any one example of an oxidation reaction occurring in daily life.	1
2.	Predict the colour change produced by a solution of Ammonium chloride on blue and red litmus papers ?	1
3.	Name any two metals which do not react with dilute acids at all	1
4.	Under which condition a concave mirror can form an erect image larger than the actual object?	1

5.	<p>Figure shows a ray of white light passing through a prism. Correct the diagram if it needs any correction & redraw it.</p> 	1
6.	<p>A full length image of a distant tall building can definitely be seen by using which type of mirror?</p> <p style="text-align: center;">OR</p> <p>On what factor the color of the scattered light depends?</p>	1
7.	<p>A wire of resistivity ρ is stretched to three times its length. What will be its new resistivity?</p>	1
8.	<p>State the direction of magnetic field in the following case:</p> 	1
9.	<p>The magnetic field in a given region is uniform. Draw a diagram to represent it.</p> <p style="text-align: center;">OR</p> <p>AB is a current carrying conductor in the plane of paper as shown in figure. Given $r_1 > r_2$, where will the strength of magnetic field be larger?</p> 	1

10.	Why did Mendel choose Pea Plant for his genetics studies?	(1)
11.	Which part of the alimentary canal receives bile from the liver? Or Choose the event that does not occur in Photosynthesis a) Absorption of light energy by chlorophyll b) Reduction of carbon dioxide to carbohydrates c) Oxidation of carbon to carbon dioxide d) Conversion of light energy to chemical energy	(1)
12.	Mention the process in which the pollen grains are received by the stigma of the same flower? Or The fertilized egg or zygote of a human being gets implanted in which part of the female reproductive system?	(1)
13.	In a foodchain, what do herbivores represent?	(1)
14.	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 the 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. e)Both A and R is false Assertion (A) : Solid Sodium Chloride does not conduct electricity Reason(R) : Conduction of electricity depends on movement of charged particles	1
15.	Assertion: If a cross is made between purple (PP) and white flowers (pp), it would result in an all white flower progeny. Reason: pp is the dominant gene. Or	(1)

	<p>Assertion : In a monohybrid cross, F1 generation indicate dominant characters</p> <p>Reason: Dominance occurs only in heterozygous state</p>	
16.	<p>Assertion: Sexual reproduction is considered better than asexual reproduction to obtain variety & diversity.</p> <p>Reason: Asexual reproduction involves mixing of character of both parents.</p>	(1)
17.	<p>Answer Q. No 17 - 20 contain five sub-parts each. You are expected to answer any four subparts in these questions.</p> <p><u>Read the following and answer any four questions from 17 (i) to 17 (v)</u></p> <p>Respiratory disease causes an immense worldwide health burden. It is estimated that 235 million people suffer from asthma, more than 200 million people have chronic obstructive pulmonary disease (COPD), 65 million endure moderate-to-severe COPD , more than 100 million adult population experience sleep disordered breathing, 8.7 million people develop tuberculosis (TB) annually , millions live with pulmonary hypertension and more than 50 million people struggle with occupational lung diseases. At least 2 billion people are exposed to the toxic effects of biomass fuel consumption, 1 billion are exposed to outdoor air pollution and 1 billion are exposed to tobacco smoke. Each year, 4 million people die prematurely from chronic respiratory disease. Infants and young children are particularly susceptible. Nine million children under 5 years of age die annually and lung diseases are the most common causes of these deaths. Pneumonia is the world’s leading killer of young children. Asthma is the most common chronic disease, affecting about 14% of children globally and is still rising. COPD is the fourth leading cause of death worldwide and the numbers are growing. The most common lethal cancer in the world is lung cancer, which kills more than 1.4 million people each year, and the numbers are growing. Respiratory tract infections caused by influenza kill 250 000–500 000 people and cost 71–167 billion US dollars annually. Respiratory infections are ranked as the greatest single contributor to the overall burden of disease in the world.</p>	(1x4)

(i) Respiratory disease causes an immense worldwide..... Burden

- a) Emotional
- b) Social
- c) Health
- d) spiritual

(ii) How are lungs designed to maximize exchange of gases?

- a) Presence of villi
- b) Presence of alveoli
- c) Presence of Bronchii
- d) Presence of nephrons

(iii) COPD is the leading cause of death worldwide and the numbers are growing.

- a) Second
- b) Third
- c) Fourth
- d) Fifth

(iv) The respiratory disorder in which inflammation of air sacs in lungs takes place is called:

- (a) Pneumonia
- (b) Asthama
- (c) Bronchitis
- (d) None of these

(v) Who all are susceptible for chronic respiratory diseases?

- a) Infants
- b) Young adults
- c) Young children
- d) both a and c

18.

Read the following and answer any four questions from 18 (a) to 18 (e)

1x4

Carbon seems to be a very friendly element. Food, clothes, medicines, books etc are all based on this versatile element carbon. In addition, all living structures are carbon based. The number of carbon compounds whose formulae are known to chemists was recently estimated to be in millions! This outnumbers by a large margin the compounds formed by all the other elements put together. The earth's crust has only 0.02% carbon in the form of minerals (like carbonates, hydrogencarbonates, coal and petroleum) and the atmosphere has 0.03% of carbon dioxide. In spite of this small amount of carbon available in nature, the importance of carbon seems to be immense.

a) Why is Carbon considered to be a friendly element?

- i. As it forms large variety of compounds
- ii. Due to catenation
- iii. Due to its tetravalency
- iv. All of the above

b) Name a tetravalent element other than carbon

- i. Nitrogen
- ii. Oxygen
- iii. Silicon
- iv. Sulphur

c) How does the element Carbon acquire the nearest noble gas configuration?

- i. By loss of valence electrons
- ii. By gain of valence electrons
- iii. By sharing its valence electrons

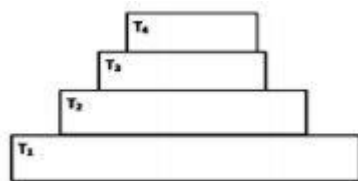
d) Which of the following compounds of carbon has a double covalent bond?

- i. Ethane
- ii. Ethene
- iii. Methane
- iv. Ethyne

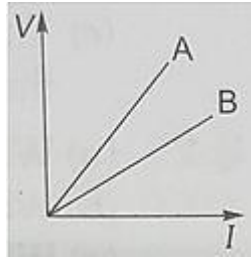
	<p>e) Which of the following is not an allotrope of carbon?</p> <ul style="list-style-type: none"> i. Diamond ii. Benzene iii. Fullerene iv. Graphite 	
19.	<p>Read the following passage and answer any four questions from 19(i) to 19 (v)</p> <p>Electromagnetic induction can be generated in two ways, namely when the electric conductor is kept in a moving magnetic field & when the electric conductor is constantly moving within a static magnetic field. The phenomenon of electromagnetic induction was first discovered by Michael Faraday when he moved a bar magnet through an electric coil. He noticed a change in the voltage of the circuit. The factors that influence the electromagnetic induction are the number of coils, the strength of the magnet, the changing magnetic fields & the speed of relative motion between coil & magnet.</p> <p>(i) What is electromagnetic induction?</p> <ul style="list-style-type: none"> (a) The process of charging a body. (b) The process of rotating a coil of an electric motor. (c) Producing induced current in a coil due to relative motion between a magnet & the coil. (d) The process of generating magnetic field due to a current passing through a coil. <p>(ii) A magnet is moved towards a coil (A) quickly & towards (B) slowly. The induced potential difference will be</p> <ul style="list-style-type: none"> (a) More in case (A) than in (B) (b) More in case (B) than in (A) (c) Same in both cases (d) Cannot be decided. <p>(iii) Which law determines the direction of induced current in a coil?</p> <ul style="list-style-type: none"> (a) Fleming's right hand rule (b) Fleming's left hand rule (c) Right hand thumb rule. (d) All of the above. <p>(iv) A device based on electromagnetic induction is</p> <ul style="list-style-type: none"> (a) Voltmeter (b) Ammeter (c) Electric motor 	1x4

	<p>(d) Electric generator</p> <p>(v) A rectangular copper coil of copper wire is rotating in a magnetic field. After how many rotations will the direction of induced current change in this coil?</p> <p>(a) Two</p> <p>(b) One</p> <p>(c) Half</p> <p>(d) Quarter</p>	
20.	<p>Read the following and answer any four questions from 20 (i) to 20 (v)</p> <p>Many optical instruments consist of number of lenses. They are combined to increase the magnification and sharpness of the image. The net power (P) of the lenses placed in contact is given by the algebraic sum of the individual powers P_1, P_2, P_3, \dots The use of powers, instead of focal lengths, for lenses is quite convenient for opticians. During eye testing an optician puts several different combination of corrective lenses of known power, in contact, inside the testing spectacles' frame. The optician calculates the power of the lens required by simple algebraic addition. The simple additive property of the powers of lenses can be used to design lens systems to minimise certain defects in images produced by a single lens. Such a lens system, consisting of several lenses, in contact, is commonly used in the design of camera lenses and the objectives of microscopes and telescopes.</p> <p>(i) Power of a lens is + 4 D. What is the nature & focal length of this lens?</p> <p>(a) Convex, + 25 cm</p> <p>(b) Concave, - 25 cm</p> <p>(c) concave, + 25 cm</p> <p>(d) None of the above.</p> <p>(ii) Relation between power (P) & focal length (f) of lens is</p> <p>(a) $P = f$</p>	1x4

	<p>(b) $P = 1/f$ (in metres)</p> <p>(c) $P = 1/f$ (in cm)</p> <p>(d) $P = 100/f$ (in m)</p> <p>(iii) The focal length of a lens of power – 2.5 D is</p> <p>(a) – 0.40 m</p> <p>(b) – 4.0 m</p> <p>(c) – 0.04 m</p> <p>(d) – 0.44 m</p> <p>(iv) A lens is made by joining a concave lens of focal length 80 cm & a convex lens of focal length 40 cm. what is the power of combination of lenses?</p> <p>(a) – 1.25 D</p> <p>(b) + 1.25 D</p> <p>(c) + 3.75 D</p> <p>(d) – 3.75 D</p> <p>(v) For which lens is the magnification is always positive?</p> <p>(a) Concave</p> <p>(b) Convex</p> <p>(c) Both concave & convex</p> <p>(d) Information is incomplete.</p>	
<u>SECTION B</u>		
21.	<p>Biodegradable and non-biodegradable substances are different from each other. Discuss and Cite examples</p> <p style="text-align: center;">Or</p> <p>Draw a common food chain of river ecosystem.</p>	(2)
22.	Answer the given questions by careful observing the pyramid	(2)



	<p>a) State the trophic levels which has maximum and minimum amount of energy. b) What is the percentage of the solar energy utilized by the T2?</p>	
23.	<p>Four samples A, B, C and D change the colour of pH paper to green, reddish pink, Blue and Orange. Their pH was recorded as 7 , 2, 10.5 and 6 respectively.</p> <p>a. Which of the samples has the highest amount of hydrogen ion concentration ? b. Arrange the four samples in the decreasing order of their pH (2)</p>	2
24.	<p>a) While baking a cake Alina accidentally added Baking soda instead of baking powder. The cake turned out fluffy but slightly bitter. Assess the cause of bitterness of the cake. b) Glucose has 12 hydrogen atoms yet its solution is neutral. Comment</p> <p>OR</p> <p>If A, B, and C are three metals and they show the following reaction</p> <p>i. $A + BX \rightarrow AX + B$ ii. $B + CX \rightarrow \text{No reaction}$ iii. $C + AX \rightarrow CX + A$</p> <p>Identify the most and the least reactive metal out of the three</p> <p>b) Why is Phosphorous stored under water and not under kerosene oil ?</p>	2
25.	<p>The refractive index of medium 'x' with respect to 'y' is $\frac{2}{3}$ & the refractive index of medium 'y' with respect to medium 'z' is $\frac{4}{3}$. Calculate the refractive index of medium 'z' with respect to medium 'x'.</p>	2
26.	<p>V-I graph for the two wires A & B are shown in the figure. If we connect both the wires one by one to the same battery, which one out of the two will produce more heat per unit time? Give justification for your answer.</p>	2



SECTION C

27. In human beings, the statistical probability of getting either a male or female child is 50 : 50. Give a suitable explanation using a flow chart

(3)

Or

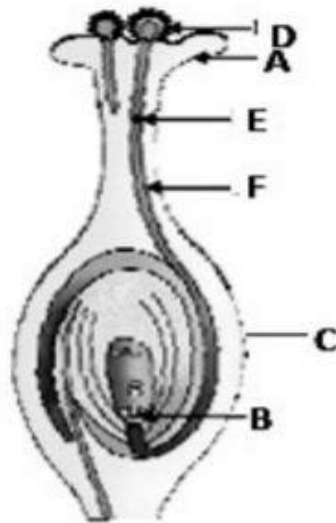
Compare alveoli in the lungs and nephrons in the kidneys with respect to their structure and functioning.(any 3 points)

28. Draw the suitable crosses to show what will be the appearance of (a) F1 and (b) F2 progenies when a pure (Homozygous) tall pea plant is crossed with a pure (Homozygous) dwarf pea plant?

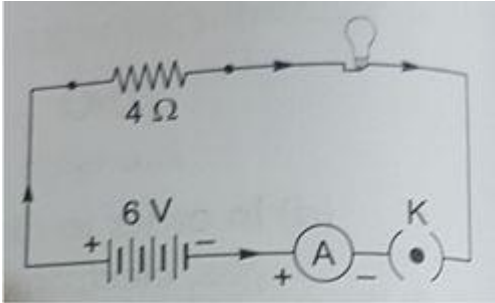
(3)

29. Identify the parts A, B, C, D , E & F in the given figure:

(3)



30.	<p>a) How can we prove that Methane, Ethane, Propane and Butane are the members of the same Homologous series ? (give two points of justification)</p> <p>b) Draw the electron dot structures of Carbon dioxide and Ammonia molecules</p>	3
31.	<p>What happens when –</p> <p>a. Lead nitrate crystals are heated</p> <p>b. Acidified water undergoes electrolysis</p> <p>c. Aqueous solution of Barium Chloride is mixed with Sodium Sulphate solution</p>	3
32.	<p>Enlist any one difference between</p> <p>a. Electrovalent and Covalent compounds</p> <p>b. Metallic Oxides and Non metallic oxides</p> <p>c. Bases and Alkalies</p>	3
33.	<p>A 3 cm tall object is placed perpendicular to the principal axis of a convex lens of focal length 30 cm. The distance of the object from the lens is 20 cm. Find the position, size & nature of the image formed.</p>	3
<u>SECTION D</u>		
34.	<p>Give reasons for the following:</p> <p>a. Tendency to lose electrons increases as we go down a group of metals.</p> <p>b. Usually in any period the first element has the largest atomic size and it decreases across a period</p>	5

	<p>c. Lithium, Sodium, Potassium belong to the same group 1</p> <p>d. The position of Hydrogen is still unclear in the modern periodic table</p> <p>e. Oxygen is more electronegative than sulphur</p> <p>OR</p> <p>Consider the elements with atomic numbers 3 to 9.</p> <p>(a) Name the most electropositive element among them</p> <p>(b) Name the most electronegative element</p> <p>(c) Name the element with smallest atomic size</p> <p>(d) Name the element which is a metalloid</p> <p>(e) Name the element which shows maximum valency.</p>	
35.	<p>i) Define contraceptive methods. Explain in brief any three contraceptive methods used to control the size of human population</p> <p>ii) Which contraceptive method can help in prevention of STDs upto some extent.</p>	(5)
36.	<p>An electric lamp of resistance 20 ohm & a conductor of resistance 4 ohm are connected to a 6 V battery as shown in the circuit.</p>  <p>Calculate :</p> <p>a) the total resistance of the circuit.</p> <p>b) the current through the circuit.</p> <p>c) the potential difference across the (i) electric lamp & (ii) conductor.</p> <p>d) power of the lamp.</p> <p>OR</p>	5

	<p>(a) How many 176 ohm resistors (in parallel) are required to carry 5 A on a 220 V line?</p> <p>(b) Show how you would connect three resistors, each of resistance 6 ohm, so that the combination has a resistance of (i) 9 ohm, (ii) 4 ohm.</p>	
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