

केन्द्रीय विद्यालय संगठन, कोलकाता संभाग
KENDRIYA VIDYALAYA SANGATHAN, KOLKATA REGION
अभ्यास सेट-II / PRACTICE SET-II : 2024-25

कक्षा /CLASS - X
विषय /SUBJECT - SCIENCE

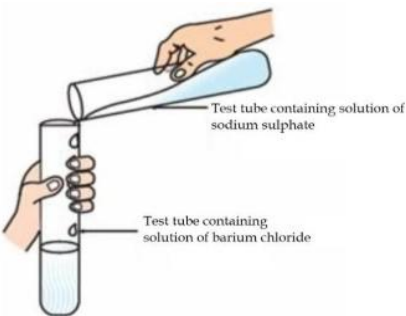
अधिकतम अंक /MAXIMUM MARKS - 80
समय /TIME – 3 घंटे / 3 HOURS

GENERAL INSTRUCTIONS

- i) This question paper consists of 39 questions in five sections.
- ii) All questions are compulsory . However , an internal choice is provided in some questions . A student is expected to attend only one of these questions
- iii) Section A consists of 20 objective type questions carrying 1 mark each.
- iv) Section B consists of 6 very short type questions carrying 2 marks each .Answers to these questions should be in the range of 30 to 50 words.
- v) Section C consists of 7 short answer type questions carrying 3 marks each .Answers to these questions should be in the range of 50 to 80 words.
- vi) Section D consists of 3 long answer type questions carrying 5 marks each .Answers to these questions should be in the range of 80 to 120 words.
- vii) Section E consists of 3 source based/ case based unit of assessment of 4 marks each with sub parts

SECTION – A

Select and write the most appropriate option out of the four options given for each of the questions 1 to 20. There is no negative mark for incorrect response.

Q.NO	QUESTIONS	MARKS
1	<p>Identify the product which represents the solid state in the above reaction.</p>  <p>a) Barium chloride b) Barium sulphate c) Sodium chloride d) Sodium sulphate</p>	1
2	<p>When Zinc reacts with sodium hydroxide , the product formed is</p> <p>a) Sodium oxide b) Sodium zincate c) Zinc hydroxide d) Zinc oxide</p>	1

3	<p>Compound obtained on reaction of iron with steam is/are</p> <ul style="list-style-type: none"> a) Fe_2O_3 b) Fe_3O_4 c) FeO d) Fe_2O_3 and Fe_3O_4 	1
4	<p>The total number of electrons shared in the formation of ethyne molecule is</p> <ul style="list-style-type: none"> a) 6 b) 3 c) 10 d) 4 	1
5	<p>In living organisms during respiration which of the following products are not formed if oxygen is not available</p> <ul style="list-style-type: none"> a) Carbon dioxide + Water b) Carbon dioxide + Alcohol c) Lactic acid + Alcohol d) Carbon dioxide + Lactic acid 	1
6	<p>Select the incorrect match (between the plant and its vegetative part) from the following</p> <ul style="list-style-type: none"> a) Bryophyllum , Leaf b) Potato , Stem c) Money-plant , Stem d) Rose , Root 	1
7	<p>Identify the food chain in which the organisms of the second trophic level are missing</p> <ul style="list-style-type: none"> a) Grass , Goat , Lion b) Zooplankton , Phytoplankton , Small fish , Large fish c) Tiger , Grass , Snake , Frog d) Grasshopper , Grass , Snake , Frog , Eagle 	1
8	<p>Two conducting wires of the same material and of equal lengths and equal diameters are first connected in series and then parallel in a circuit across the same potential difference. The ratio of heat produced in series and parallel combinations would be -</p> <ul style="list-style-type: none"> a) 1:2 b) 2:1 c) 1:4 d) 4:1 	1

9	An electric bulb is rated 220 V and 100 W. When it is operated on 110 V. The power consumed will be - a) 100 W b) 75 W c) 50 W d) 25 W	1
10	When a pure tall pea plant is crossed with a pure dwarf pea plant, the percentage of tall pea plant in F ₁ and F ₂ generation pea plants respectively will be a) 100% , 25% b) 100% , 50% c) 100% , 75% d) 100% , 100%	1
11	Select from the following the statement which is true for bases a) Bases are bitter and turn blue litmus red. b) Bases have a pH less than 7 c) Bases are sour and change red litmus to blue. d) Bases turn pink when a drop of phenolphthalein is added to them	1
12	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) Mechanical energy d) Light energy	1
13	Phenotypic ratio in F ₂ generation in dihybrid cross is a) 3 : 1 b) 9 : 3 : 3 : 1 c) 1 : 2 : 1 d) 2 : 1	1
14	$MnO_2 + xHCl \rightarrow MnCl_2 + yH_2O + zCl_2$ In order to balance the above chemical equation , the value of x , y and z respectively are a) 6 , 2 , 2 b) 4 , 1 , 2 c) 4 , 2 , 1 d) 2 , 2 , 1	1
15	If salivary amylase is lacking in the saliva, which of the following events in the mouth cavity will be affected ? a) Proteins breaking down into amino acids b) Starch breaking down into sugars c) Fats breaking down into fatty acids and glycerol d) Absorption of vitamins	1

16	An element X reacts with O ₂ to give a compound with a high melting point . This compound is also soluble in water . The element X is likely to be a) Iron b) Calcium c) Carbon d) Silicon	1
	Question numbers 17 to 20 consists of two statements – Assertion (A) and Reason (R). Answer these questions selecting the appropriate option given below a) Both A and R are true, and R is the correct explanation of A b) Both A and R are true , and R is not the correct explanation of A c) A is true but R is false d) A is false but R is true	
17	Assertion : An ecosystem consists of biotic components and abiotic components Reason : Biotic and abiotic components play important roles for the sustenance of life and work independently in all ecosystems	1
18	Assertion : The magnetic field is stronger at a point which is nearer to the conductor and goes on decreasing on moving away from the conductor. Reason : The magnetic field produced by a straight current carrying wire is inversely proportional to the distance from the wire	1
19	Assertion : The rate of breathing in aquatic organisms is much faster than in terrestrial organisms. Reason : The amount of oxygen dissolved in water is very high as compared to the amount of oxygen in air .	1
20	Assertion : Esterification is a process in which a sweet smelling substance is produced. Reason : When esters react with sodium hydroxide an alcohol and sodium salt of carboxylic acid are obtained.	1

SECTION – B

Question no. 21 to 26 are very short answer questions carrying 2 marks each

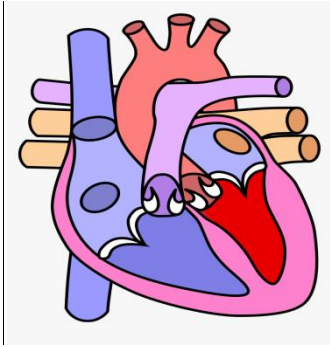
21	a) Name the type of bonds formed when one carbon atom combines with four hydrogen atoms to form a molecule . b) Write the name and formula of first member of homologous series of alkenes.	2
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22	<p>Write one specific function of each of the following organs in relation with excretion in human beings</p> <ol style="list-style-type: none"> Renal artery Urethra Glomerulus Tubular part of nephron <p style="text-align: center;">OR</p> <p>Mention the pathway of urine in our body starting from the organ of its formation to its excretion . What will happen if the tubular part of the nephron does not work properly ?</p>	2
23	<p>A person is not able to see distinctly the objects placed beyond 90 cm from him. Give reasons to identify the defect in his eye. Determine the nature of lens used to correct this defect.</p>	2
24	<p>What is the function of an Earth wire? Why is it necessary to Earth metallic appliances?</p>	2
25	<p>What is ozone ? Name the chemicals that damage the ozone layer.</p>	2
26	<p>In tobacco plant , the male gamets have twenty four chromosomes. What is the number of chromosomes in the female gamete ? What is the number of chromosomes in the zygote ?</p>	2

SECTION – C

Question no. 27 to 33 are short answer questions and carry 3 marks each

27	<p>Write one example of each of the following</p> <ol style="list-style-type: none"> Most malleable metal and most ductile metal. The best conductor of heat and the poorest conductor of heat . A metal with highest melting point and a metal with lowest melting point . 	3
28	<p>Write one chemical equation each for the chemical reaction in which the following have taken place</p> <ol style="list-style-type: none"> Change in colour Change in temperature Formation of precipitate 	3

	OR	
	i) Define oxidation ii) Identify the oxidising agent in the following chemical equations a) $\text{Pb}_3\text{O}_4 + 8\text{HCl} \rightarrow 3\text{PbCl}_2 + \text{Cl}_2 + 4\text{H}_2\text{O}$ b) $3\text{MnO}_2 + 2\text{Al} \rightarrow 3\text{Mn} + \text{Al}_2\text{O}_3$	
29	Name the hormone required for the following. Also mention the name of endocrine gland from which that hormone is secreted a) Lowering of blood glucose b) Development of moustache and beard in human males c) Metabolism of carbohydrates , fats and proteins	3
30	(i) A compound lens is made of two lenses in contact having powers +12.5D and -2.5D. Find the focal length and power of the combination. (ii) The magnification produced by a mirror is +1. What does this mean ?	3
31	<div style="text-align: center;">  </div> <p>Name the chamber that receives oxygen rich blood and name the blood vessel which bring it. State the significance of separation of right and left side of heart .</p>	3
32	It is desired to obtain an erect image of an object, using concave mirror of focal length of 12 cm. (i) What should be the range of the object distance in the above case? (ii) Will the image be smaller or larger than the object? Draw a ray diagram to show the formation of image in this case. (iii) Where will the image of this object be, if it is placed 24 cm in front of the mirror?	3
33	State the rule to determine the direction of a (i) magnetic field produced around a straight conductor-carrying current, (ii) force experienced by a current-carrying straight conductor placed in a magnetic field which is perpendicular to it, and (iii) current induced in a coil due to its rotation in a magnetic field.	3

SECTION-D

Question no. 34 to 36 are long answer questions and carry 5 marks each

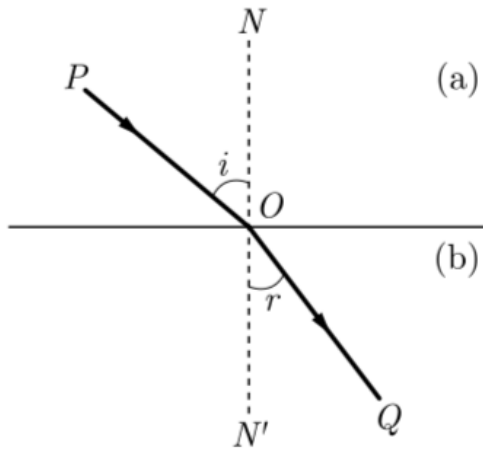
34	<p>i) A compound 'A' with molecular formula of $C_2H_4O_2$ reacts with a base to give salt and water . Identify 'A' and name the functional group it possesses. Write chemical equation for the reaction involved.</p> <p>ii) When the above stated compound 'A' reacts with another compound 'B' having molecular formula C_2H_6O in presence of an acid , a sweet smelling compound 'C' is formed.</p> <p>a) Identify B and C. b) State the role of acid in this reaction. c) Write chemical equation for the reaction involved.</p> <p style="text-align: center;">OR</p> <p>An acid 'X' and an alcohol 'Y' react with each other in presence of an acid catalyst to form a sweet smelling substance 'Z'. Identify 'X','Y' and 'Z'. Write the chemical equation for the reaction involved and name it. The substance 'Z' on treatment with sodium hydroxide produces back the alcohol 'Y' and sodium ethanoate . Write the chemical equation for the reaction involved and name it .</p>	5
35	<p>a) Name the organ that produces sperms as well as secretes a hormone in human male s. Name the hormone it secretes and write its functions.</p> <p>b) Name the part of the human female reproductive system where fertilisation occurs.</p> <p>c) Explain how the developing embryo gets nourishment inside the mother's body .</p>	5
36	<p>(i) On what factors do the resistance of a conductor depends?</p> <p>(ii) Will current flow more easily through a thick wire or a thin wire of the same material when connected to the same source? Why?</p> <p>(iii) An electric lamp of 100 Ohm, a toaster of resistance of 50 Ω, and a water filter of resistance of 500 Ohms are connected in parallel to a 220V source. What is the resistance of an electric iron connected to the same source that takes as much current as all three appliances, and what is the current through it?</p>	5

SECTION E

Question numbers 37 to 39 is case/data based question with 4 short sub parts .

37	<p>The most obvious outcome of the reproductive process is the generation of individuals of similar design , but in sexual reproduction they may not be exactly alike . The resemblances as well as differences are marked .The rules of heredity determine the process by which</p>	4
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	<p>traits and characteristics are reliably inherited . Many experiments have been done to study the rules of inheritance .</p> <p>a) Why an offspring of human being is not a true copy of his parents in sexual reproduction ?</p> <p>b) While performing experiments on inheritance in plants , what is the difference between F₁ and F₂ generation ?</p> <p>c) Why do we say that variations are useful for the survival of a species over time ?</p> <p style="text-align: center;">OR</p> <p>c) Study Mendel's cross between two plants with a pair of contrasting characters.</p> <p>RRYY X rryy Round Yellow Wrinkled Green</p> <p>He observed 4 types of combinations in F₂ generation . which of these were new combinations ? Why do new features which are not present in the parents , appear in F₂ generation ?</p>	
38	<p>A copper vessel gets tarnished due to formation of an oxide layer on its surface . On rubbing lemon on the vessel , the surface is cleaned , and the vessel begins to shine again . This is due to the fact that it reacts with the acid present in lemon to form a salt which is washed away with water . As a result , the layer of copper oxide is removed from the surface of the vessel and the shining surface is exposed.</p> <p>a) Which acid is present in lemon ?</p> <p>b) What is the nature of copper oxide ?</p> <p>c) Why a tarnished copper vessel regains its shine when rubbed with lemon?</p> <p>d) Name the phenomenon of copper getting tarnished ?</p>	4
39	<p>When light ray goes from one transparent medium to another transparent medium, it suffers a change in direction, into second medium. The extent of the change in direction suffered by the phenomenon of change in the path of light rays when going from one medium to another medium is known as refraction. Ray is a given pair of media can be expressed in terms of refractive index. The refractive index is related to an important physical quantity in the relative speed of light in different media.</p>	4



(i) When light goes from one medium to another, which of the three parameters: frequency, wavelength, velocity change?

(ii) A ray of light enters into the glass from air. Does it bend towards normal?

(iii) Light enters from air to glass having refractive index 1.50. What is the speed of light in the glass? The speed of light in vacuum is $3 \times 10^8 \text{ ms}^{-1}$.

(iv) what is the unit of Refractive index ?