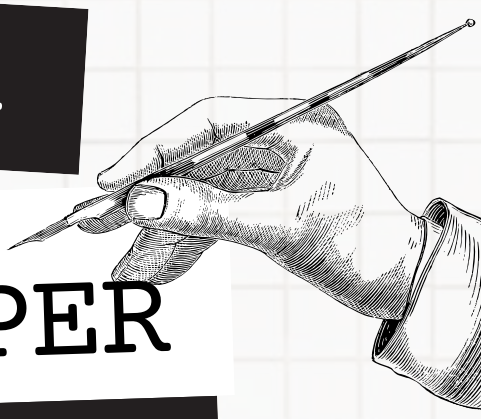
2024

Pre-Board



QUESTION PAPER

CBSE BOARD / STATE BOARDS

NCERT Based Syllabus



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PREBOARD –I (2023-24)

CLASS – X

SUBJECT-SCIENCE

TIME: 3 HRS **M.M: 80**

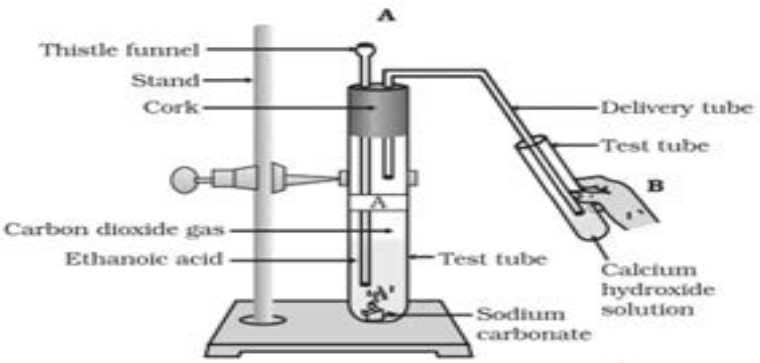
General Instructions:

1. The question paper consists of five sections – A, B, C, D& E.
2. Attempt every part of all 39 questions neatly by giving correct answer number. Marks for each question are indicated against each question.
3. All questions in section A are one mark questions comprising MCQsand Assertion-Reason questions.
4. In Section -B, VSA type questions carrying two marks each.
5. In Section- C, SA type questions carrying 3 marks each.
6. In Section-D, LA type questions carrying 5 marks each.
7. In Section –E, Case-study based /CCT based questions carrying four marks each. However, aninternal choice is provided in some questions.

	SECTION – A	
1	Identify this particular metallurgical step in the chemical reaction below: $ZnCO_3 \xrightarrow{\Delta} ZnO + CO_2$ a). Roasting b). Calcination c). Smelting d). Thermal refining	1
2	Out of the following organs of human alimentary canal which produces bile juice is: a). Stomach b). Liver c). Gall bladder d). Pancreas	1
3	The value of following physical quantity remains same in the parallel connection: a). Electric Charge b).Electric Resistance c). Electric Current d). Voltage	1
4	Select chemical name of Washing soda from the following: a). Sodium carbonate b). Sodium Hydrogen Carbonate c). Sodium Carbonate decahydrate. d).Sodium Carbonate dihydrate	1
5	Amongst these compounds, which does not contain any water of crystallization is: a). Plaster of Paris b). Gypsum c). Bleaching powder d). Washing soda	1
6	The antioxidant gas used in packets of potato chips to prevent rancidity is: a). oxygen b). Ammonia c). Nitrogen d). Helium	1
7	The mode of nutrition found in unicellular Protozoa Amoeba is: a). Holozoic b). Saprotrophic c). Parasitic d). Insectivorous	1
8	The important functions of the structure shown below is/are:  a). Photosynthesis. b). Transpiration. c). Respiration.d). All of these.	1

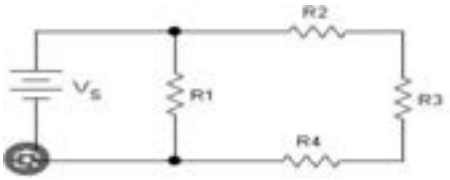
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9	Identify thegenetic composition of a normal child who inherits X chromosome from father: a).XX b). XY c). XYY d). XO	1
10	The chemical reaction between potassium chloride and silver nitrate is given by the chemical equation. $AgNO_3 + KCl \rightarrow AgCl + KNO_3$. What can be inferred from the chemical equation? a). silver nitrate and potassium chloride undergo a decomposition reaction to form silver chloride and potassium nitrate. b). silver nitrate and potassium chloride undergo a displacement reaction to form silver chloride and potassium nitrate. c). silver nitrate and potassium chloride undergo a combination reaction to form silver chloride and potassium nitrate. d). Silver nitrate and potassium chloride undergo double displacement reaction to form silver chloride and potassium nitrate.	1
11	If the current is flowing towards west direction in a straight conductor, the direction of magnetic field lines would be: a).Towards north b). Towards south c). Towards east d). Towards west	1
12	Which of the following statement is true for chemical reaction given in following figure:  a). Yellow precipitate is formed b). Soap is produced. c). Calcium Hydroxide turns milky d). Calcium Hydroxide turns blue-black	1
13	The phenomenon of twinkling of stars is due to: a). Dispersion b). Tyndall effect c). Atmospheric refraction d). Reflection	1
14	A plant hormone which helps in bending of stem of plant towards light is: a). Auxin b). Gibberellin c). Cytokinin d). Ethylene	1
15	Identify name of the Functional group attached in the following hydrocarbon:  a). Alcohol b). Ketone c). Aldehyde d). Carboxylic acid	1
16	The S.I unit used to measure Specific resistance is: a). Ohm m b). Ohm c). Volt d). No unit	1
Q. no 17 to 20 are Assertion - Reasoning based questions.		

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	These consist 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 (A) -**The main product formed by reaction of Zinc with Sodium Hydroxide is Sodium Zincate **Reason (R)**-Zinc cannot displaces Sodium from its solution.	1
18	**Assertion (A): PbO + C → Pb + CO is a reduction reaction**. **Reason(R)**: PbO is reduced and C is oxidized.	1
19	**Assertion:** The strength of the magnetic field produced at the centre of the circular coil increases on increasing the number of turns in it. **Reason:** The current in each circular turn has the same direction and the magnetic field due to each turn the just adds up.	1
20	**Assertion:**Uterine wall called endometriumbreaks down andbleeding occurs in humanfemales. **Reason:** It takes place due to non - fertilization of the ovum.	1
	SECTION – B	
21	Define reflexes and draw the neat flow-chart of a reflex arc when we touch a hot plate.	2
22	An electric motor takes 5A from a 220V line. Determine the power of the motor and the energy consumed in 2 hrs? **OR** Calculate the equivalent resistance in the following network when value of R1,R2,R3& R4are 4Ohm,6 Ohm,8 Ohm & 2 Ohm respectively which are connected to 20 V battery. 	2
23	Write one chemical equation each for decomposition reaction where energy is supplied in the form of heat and light energy.	2
24	A deadly poisonous gas found in the upper layers of the air is essential for all living organisms. This gas has started dwindling in the 1980s. a) Identify this gas. b) Give the full form ofcompounds responsible for its Depletion. c) Why is the damage of this layer a cause of concern to us?	2
25	Mention the major organs that constitute the excretory system in humans.	2
26	How are the lungs designed in humans to maximize the area for exchange of gases?	2
	SECTION- C	

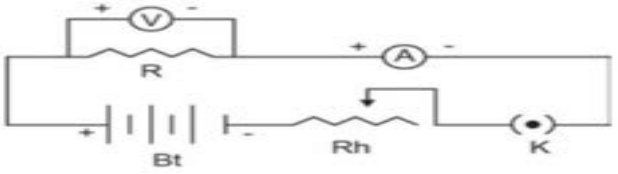
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<table>
<tr><td>27</td><td>Give reasons for the following:
a). Silver foils are used for decorating sweets.
b). Silver is used for polishing mirrors.
c). Silver is used in solar cells.</td><td>3</td></tr>
<tr><td>28</td><td>a). In the following food chain,calculate the amount of energy available to Tiger, if energyradiated by sun is 10,000 KJ.
Grass → Deer → Tiger → Mushroom
b).Name the trophic level represented by Tiger.
c). What is the role of Mushroom in the ecosystem?</td><td>3</td></tr>
<tr><td>29</td><td>An object 5cm high is placed at a distance of 20 cm in front of a convex mirror with radius of curvature30 cm. Find the nature, position and size of the image.</td><td>3</td></tr>
<tr><td>30</td><td>What is Double Circulation.Explain through flowchart.
OR
Write three important events that occur during Photosynthesis process.</td><td>3</td></tr>
<tr><td>31</td><td>Study the table related to pH values and answer the questions that follow-
<table><tr><th>S.NO.</th><th>CHEMICAL SOLUTION</th><th>PH VALUE</th><th>COLOUR DEVELOPED</th></tr><tr><td>1</td><td>K</td><td>2.1</td><td>RED</td></tr><tr><td>2</td><td>L</td><td>7.0</td><td>GREEN</td></tr><tr><td>3</td><td>M</td><td>9.8</td><td>BLUE</td></tr><tr><td>4</td><td>N</td><td>13.6</td><td>VIOLET</td></tr></table>a). Which chemical solution amongst these is most basic?
b). Which solution is distilled water?
i)K ii) L iii) M iv) N
c).Which colour shows maximum hydrogen ion concentration?
i) Red ii) Blue iii) Green iv) Violet</td><td>3</td></tr>
<tr><td>32</td><td>A child while playing with his father’s spectacles burnt a hole in a piece of paper by focusing a small image of the sun on it.
a). What defect of vision his father is suffering from?
b). Write two causes for this defect?
c). Name thecorrective lens used for above defect and draw the figure of its correction.</td><td>3</td></tr>
<tr><td>33</td><td>(i) Write any two characteristics of magnetic field Lines?
(ii) Draw magnetic lines of force around current carrying solenoid showing the direction of poles developed.</td><td>3</td></tr>
<tr><td colspan="3">SECTION - D</td></tr>
<tr><td>34</td><td>a). “ The sex of the children is determined by what they inherit from their father and not the mother.” Justify this statement.
b). Mendel crossed pure pea plant having purple flowers with pure pea plant bearing white coloured flowers.
i. Obtain the genotype ratio in F1 generation.
ii. What type of cross is it?
iii. Which is dominant trait in this case?
iv. Find the %of purple flowers in F2 generation obtained by self-pollination of F1 generation.</td><td>5</td></tr>
</table>

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35	Draw electron -dot structure of compound MgO and write the type of chemical bonding between Mg and O in its molecule. Why are such compounds good conductors of electricity? **OR** a) Differentiate between Roasting and Calcination. b) A metal X which is used in Galvanization to prevent rusting on Iron articles is extracted from its Carbonate ore. Write the different chemical equations involved in its metallurgy.	5
36	a). Show the course of light ray through a rectangular glass-slab. Mark various angles and rays. b).The refractive index of three different medium A,B,C and D are- **MEDIUM** | **A** | **B** | **C** | **D** **REFRACTIVE INDEX** | **1.3** | **1.7** | **1.4** | **1.5** In which medium, angle of refraction is- (i) minimum (ii) maximum	
SECTION - E **Case – Study based question numbers 37-39 on the basis of your understanding of the following paragraphs and the related studied concepts**		
37	A student madea compound 'C' (molecular formula, $C_2H_4O_2$) react with Na-metal toform a compound 'R' and observes a gas produced which burns with a pop sound. Compound 'C' on treatment with an alcohol 'A' in presence of an acid formed a sweet-smelling compound 'S' (molecular formula, $C_4H_8O_2$). 'S' on treatment with NaOH solution gives back 'R' and 'A'. a). Is 'C'- Ethanoic acid or Ethanol ? b). Write the structural formula of 'A' c).What is the chemical name of 'S'? d). Write down the chemical reaction between 'C' and 'A'.	4
38	A student connects a battery, key, Rheostat, voltmeter, ammeter, resistor with connecting wire in an electric circuit to study dependance of electric current on potential difference as shown in the given circuit diagram. He verifies this Law by the experiment in the laboratory. Initially, the rheostat is adjusted to get the minimum reading in ammeter A and voltmeter V. Current in the circuit is increased gradually by moving the sliding terminal of the rheostat. During the process, the current flowing in the circuit and the corresponding value of potential difference across the resistance wire 'R' are recorded. Also the graph of current against potential difference was plotted.  a). what does plotted graph between V & I suggest? b). Does the electric resistance depend on the length of the conductor?	4

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	c).Which of the given statements is NOT TRUE, regarding the electrical set-up for the verification of Ohm's law: i. The voltmeter is connected in parallel with the known resistance ii. The ammeter is connected in series circuit iii. The rheostat can only increase the resistance in electric circuit iv. The single key is used to switch on/off the electric circuit. d). What electric device is used to measure electric current flowing in the circuit?	
39	For unicellular organisms, cell division leads to the creation of new individuals. Many bacteria and protozoa like amoeba or Leishmania simply split into two equal halves during cell division. Yeast, on the other hand can put out small buds that separate and grow further. The modes by which organisms reproduce depend on the body design of the organisms.In the multi-cellular organisms with simple body organization, some simple reproductive methods can still work such as fragmentation. But it is not true for all multicellular organisms. a). Name the process of protozoa splitting into two equal halves? b). Does Amoeba uses asexual mode of reproduction? c). Unicellular organism- yeast reproduces asexually by – (i). binary fission (ii).multiple fission (iii). budding (iv). fragmentation d). Give one example of an organism which reproduces through fragmentation.	

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ANSWER KEY

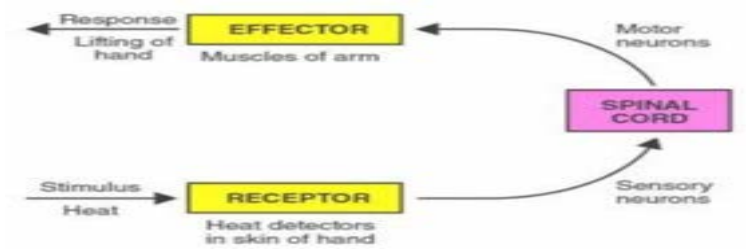
CLASS-X SUBJECT – SCIENCE

SECTION – A

Ans. 1. b
Ans. 2. b
Ans. 3. d
Ans. 4. c
Ans. 5. c
Ans. 6. c
Ans. 7. a
Ans.8.d
Ans. 9. a
Ans. 10. d
Ans. 11. a
Ans. 12. c
Ans. 13. c
Ans. 14. a
Ans. 15. d
Ans. 16. a
Ans. 17. a
Ans. 18. d
Ans. 19. a
Ans. 20. a (1*20=20)

SECTION – B

Ans. 21. Reflexes are very sudden, automatic & unconscious response of the body parts towards stimuli. (0.5+1.5=2)



Ans. 22. Given: I=5A V= 220V

a. Power(P)= V X I = 220V X 5A
=1100VA = 1100W

= 1.1KW

a. Electrical energy consumed E= P x t = 1.1 x 2h=2.2kWh.(1+1=2)

OR

i) Rs=R2+R3+R4 =6+8+2=16 Ohm
ii) 1/Rp=1/R1+1/Rs
=1/4 + 1/16
1/Rp=4+1/16
1/Rp =5/16

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Rp= 16/5 =3.2 Ohm (1+1=2)

Ans. 23.a. Thermal Decomposition: Energy supplied in the form of heat. $CaCO_3 \rightarrow CaO + CO_2$

b.Photolytic Decomposition : Energy is supplied in the form of light. $2AgCl \rightarrow 2Ag + Cl_2$ (1+1=2)

Ans. 24. a. Ozone gas b. CFCs- ChloroFluoro Carbons c. Ozone layer acts as a protective shield and protect us from harmful UV rays of the sun. (1/2+1/2+1=2)

Ans. 25. Organs of human excretory system are: Kidney, ureter, Urinary bladder &urethra(1/2*4=2)

Ans. 26. (Any two points) (1+1=2)

a. Alveoli are tiny balloon like structures present in millions of number.

b. They provide large surface area for exchange of gases.

c. They are richly supplied with blood capillaries.

SECTION- C

Ans. 27.a). Silver is highly malleable metal b). Silver is one of the most lustrous metal.

c). Silver is best conductor of electricity. (1+1+1=3)

Ans. 28. a). Amount of energy available to Grass (1%) = 10000* 1/100=100kJ (1.5+1/2+1=3)

Amount of energy available to Deer (10%) = 100* 10/100 =10kJ

Amount of energy available to Tiger (10%) = 10* 10/100 = 1kJ

b). Secondary Consumer (Carnivore)

c). Mushrooms act as decomposers and help in decomposing the organic matter into humus.

Ans. 29.Given: ho =5 cm u = -20 cm R =30 cm f =R/2=30/2=15 cm

a). $1/f = 1/v + 1/v$

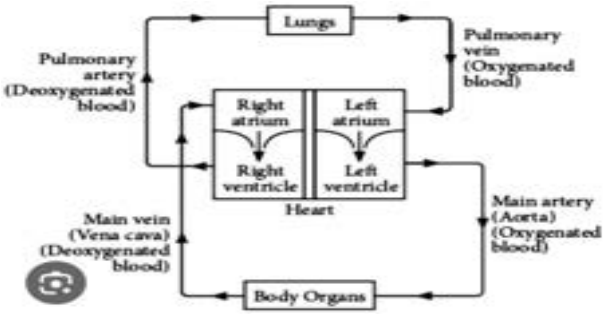
$1/v = 1/f - 1/u$
$1/v = 1/15 - 1/-20$
$1/v = 1/15 + 1/20$
$1/v = 4+3/60$
$1/v = 7/60$
$V = 60/7 = 8.57$cm

b). $m = hi/ho = -v/u$

$hi = -v * ho/u$
$hi = - 60/7 * 5/-20$
$hi = 2.14$ cm

c). Nature: Virtual & erect and smaller (1.5+1+1/2=3)

Ans.30. a). The circulation of blood two times through the heart in one cycle.



OR

The following events occur during photosynthesis: (1+1+1=3)

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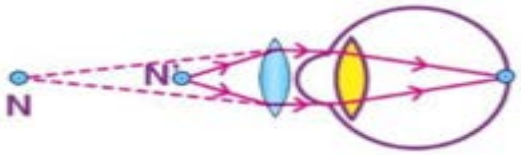
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a. Absorption of light energy by chlorophyll (Light reaction).
b. Conversion of light energy to chemical energy and splitting of water molecules into hydrogen and oxygen (Photolysis).
c. Reduction of Carbon dioxide to carbohydrates(Dark reaction).

Ans. 31. a. N b. ii c. i (1+1+1=3)

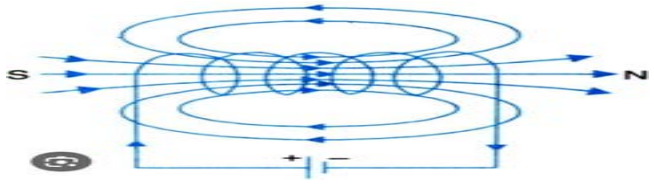
Ans. 32.a. Hypermetropia (far sightedness)(1+2+1+1=5)

a. Causes(any two): Shortening of eye ball, Increase in focal length of eye lens, Image is formed beyond retina.
b. Correction: Using Convex lens of suitable focal length.



Ans. 33.Characteristics of Magneticfieldlines (any two): (2+1=3)

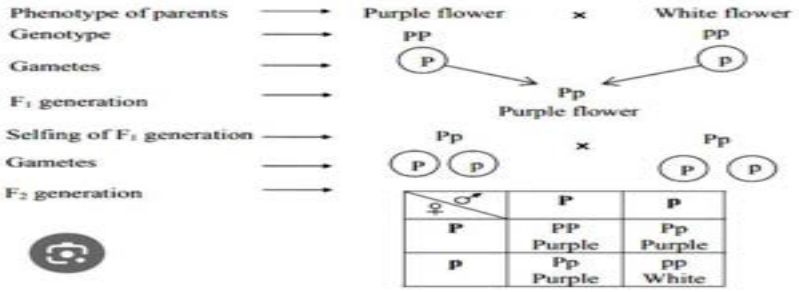
a. They always originate from North Pole of the magnet.
b. They are closed concentric circles.
b. They never intersect each other at any point.
c. They have both magnitude and direction (vector) at any point on the field.



SECTION - D

Ans.34.a. This statement is true because the sex of the child is determined by the sex chromosomes. If a sperm carrying X chromosomes fertilises an ovum, it is a female child and it will a male child only when a sperm carrying Y chromosome fertilises an ovum, Therefore ,it is totally a matter of chance that which sperm fertilises an ovum. (1.5+2+1/2+1/2+1/2=5)

b.i. genotype ratio: 4: 0 (Purple : White)



ii. Monohybrid cross

iii. Purple coloured flower

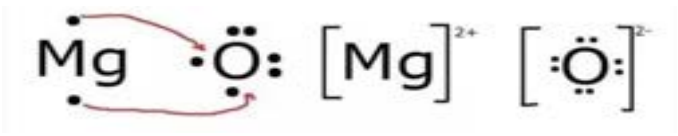
iv. % of Purple flowers in F2= 3/4*100

=75%

Ans.35.a (2+1+1+1=5)

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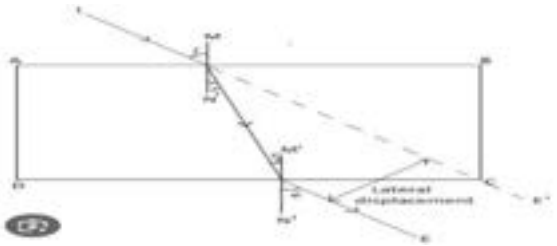


b.Ionic Bonding (Electrovalent bonding)

c. Due to the presence of ions.

d. Ionic compounds have strong force of attraction between the oppositely charged ions.

Ans.36.a. (3+1+1=5)

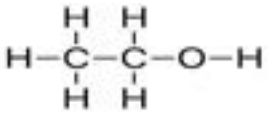


b).i. B ii. A

SECTION – E

Ans. 37.a). Ethanoic acid (1+1+1+1=4)

b).



a. S= Ethyl ethanoate (ester)

b. $CH_3COOH + C_2H_5OH$ -----$CH_3COOC_2H_5 + H_2O$

Ans. 38. a). Current(I) is directly proportional to Potential difference(V). Current increases with increases with Voltage (V/I=R) (1+1+1+1=4)

b.Yes c. iii. D. Ammeter

Ans.39.a). Binary fission b). Yes c). iii. d). Spirogyra

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