

APEEJAY COMMON PREBOARD EXAMINATION
Class- X
Subject: Science (086)- 2022-23

Max. Marks: 80

Time Allowed: 3 hours

General Instructions:

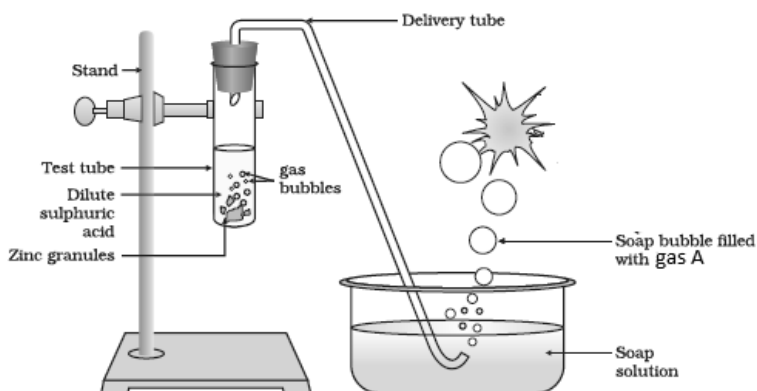
- i. This question paper consists of 39 questions in 5 sections.
- ii. All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.
- iii. **Section A** consists of 20 objective-type questions carrying 1 mark each.
- iv. **Section B** consists of 6 very short questions carrying 02 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 03 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 05 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 questions of 04 marks each with sub-parts.

SECTION – A

Select the most appropriate option out of the four options given for each of the questions 1 – 20

1. What would be the chemical formula that would be formed by the combination of Lithium and oxygen molecule? 1
 - a) Li_2O
 - b) LiO_2
 - c) LiO
 - d) Li_2O_3

2. How would you identify the gas 'A' evolved in the experimental set-up shown in the given figure? 1
 - a) Pass the gas through lime water, it turns lime water milky
 - b) When a burning splinter is brought near the gas it burns with pop sound
 - c) Gas when passed through red litmus solution it changes into blue
 - d) Gas evolved has smell of sulphur



3. Observe the flow chart and find out the correct combination of observations. 1

	Metal	Gas evolved
i	Cu	Yes
ii	Fe	Yes
iii	Mg	No
iv	Zn	Yes

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graph TD
    METAL[METAL] --> Dil_HCl[Dil. HCl]
    Dil_HCl --> METAL_SALT[METAL SALT]
    Dil_HCl --> GAS[GAS]
    
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- a) i and iii
- b) i and iv
- c) ii and iii
- d) ii and iv

4. In the reaction shown below, 1
 $2\text{H}_2\text{S} + \text{SO}_2 \rightarrow 3\text{S} + 2\text{H}_2\text{O}$
 Which option in the given table correctly represents the substance oxidised and the reducing agent?

Option	Substance Oxidised	Reducing Agent
a)	SO_2	$2\text{H}_2\text{S}$
b)	$2\text{H}_2\text{S}$	$2\text{H}_2\text{S}$
c)	SO_2	3S
d)	SO_2	$2\text{H}_2\text{O}$

5. Which of the given options correctly represents the formation of Potassium sulphate from the parent acid? 1

Option	Parent Acid	Parent Base
a)	H_2SO_3	KNO_3
b)	HNO_3	KOH
c)	H_2SO_4	KOH
d)	H_3PO_4	KNO_3

6. 10ml of freshly prepared iron sulphate solution was taken in test tubes labelled A, B, C and D. 1
 Strips of Copper, Iron, Zinc and Aluminium were added, in test tubes A, B, C and D respectively. A black residue was obtained in two of them. Which of the following metal pair will show the above observation correctly?

- a) Fe and Al
- b) Cu and Zn
- c) Zn and Fe
- d) Zn and Al

7. Name the salt formed when sodium carbonate reacts with ethanoic acid. 1

- a) Sodium Nitrate
- b) Sodium acetate
- c) Sodium carbonate
- d) Sodium sulphate

8. Enzyme A digests Protein in an acidic medium at site B. Identify 'A' and 'B'. 1

- a) A: Trypsin B: Pancreas
- b) A: Pepsin B: Liver
- c) A: Pepsin B: Stomach
- d) A: Lipase B: Small intestine

9. The correct sequence of aerobic reaction taking place at the cellular level in human being is 1

- a) Glucose -----Pyruvate (Cytoplasm)-----Ethanol +Carbon dioxide
- b) Glucose -----Pyruvate (Mitochondria)-----Lactic acid
- c) Glucose -----Pyruvate (Mitochondria)-----Carbon dioxide +water+ Energy
- d) Glucose -----Pyruvate (Cytoplasm)-----Carbon dioxide + water+ Energy

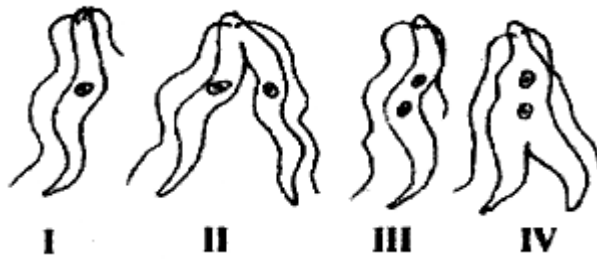
10. Blue eye colour in humans is recessive to brown eye colour. If a blue-eyed woman (bb) marries a brown eyed man (Bb), what will be the probability of eye colour in their offsprings? 1

- a) One blue eyed and one brown eyed
- b) All Blue eyed

- c) One black eyed and one brown eyed
- d) All black eyed

11 The correct order of binary fission in Leishmania is

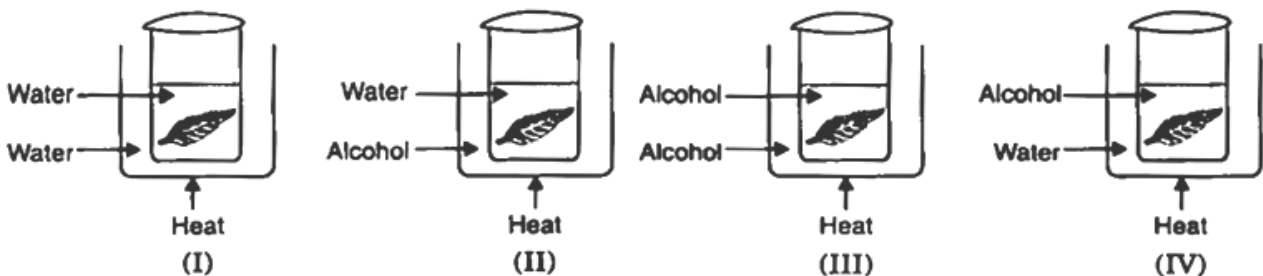
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- a) II, III, IV, I
- b) III, I, II, IV
- c) I, IV, III, II
- d) I, III, IV, II

12 Which one of the following is the correct method/ set up for removing chlorophyll from the leaves?

1



- a) I
- b) IV
- c) II
- d) III

13 The focal length of the eye lens increases when eye muscles are:

1

- a) Relaxed and lens becomes thinner
- b) Contracted and lens becomes thicker
- c) Relaxed and lens becomes thicker
- d) Contracted and lens become thinner

14 How will you use two identical prisms so that a beam of light incident on one prism emerges out of a second prism as white light?

1

- a) One placed on the top of the other.
- b) One placed inverted with respect to the other.
- c) When placed side by side.
- d) When placed perpendicular to each other.

15 Consumption of electrical energy can be expressed in:

1

- a) Kilo Watt hour
- b) Joules
- c) Watt second
- d) All the above options

- 16 Two conducting wires are of the same material, of equal lengths and of equal diameter. They are first connected in series and then in parallel in a circuit across the same potential difference. The ratio of heat produced in parallel and in series combination would be: 1
- a) 1:2
 - b) 2:1
 - c) 1:4
 - d) 4:1

Q. no 17 to 20 are Assertion - Reasoning based questions.

These consist of two statements – Assertion (A) and Reason (R). Answer these questions by selecting the appropriate option given below:

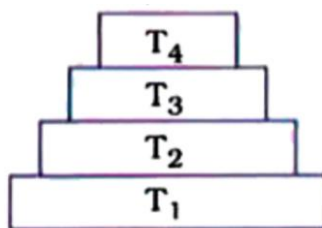
- (a) Both A and R are true and R is the correct explanation of A
 - (b) Both A and R are true and R is not the correct explanation of A
 - (c) A is true but R is false
 - (d) A is False but R is true
- 17 Assertion: (A) There are two structural isomers of butane. 1
Reason: (R) Structural isomers have the same molecular formula but they differ in their structures.
- 18 Assertion: (A) During the daytime, water enters the xylem through transpirational pull. 1
Reason: (R) The pressure generated due to loss of water, pulls the water in the xylem.
- 19 Assertion (A): Energy is used during respiration. 1
Reason(R): In Respiration energy is stored in the form of ATP.
- 20 Assertion: (A) Fuse wire is always connected in parallel with the device in a household circuit. 1
Reason: (R) Electric fuse melts and breaks the circuit whenever the current in the circuit increases beyond the specific value.

SECTION – B

Q. no. 21 to 26 are very short answer questions.

- 21 An atom of an element 'X' has 4 shells and 1 electron in N shell. When treated with cold water, it produces base 'Y' having the chemical formula XOH and it also liberates a gas 'Z'. Identify X, Y and Z and also write the chemical equation involved. 2
- OR
- a) Name the alloy which only comprises of copper and zinc metal. Mention any one of its use.
 - b) Why solder is suitable for welding electrical wires and not its constituent elements?
- 22 Define Peristaltic movement. What is the significance of this movement in the alimentary canal? 2
- 23 If an organism is having twenty-four chromosomes in its male gamete, 2
- a) What will be the number of chromosomes in the female gamete?
 - b) What will be the number of chromosomes when a zygote is formed?
 - c) What will be the number of chromosomes in the cell before the division?
 - d) What will be the number of chromosomes in the offspring produced if it reproduces asexually?

- 24 Various trophic levels are depicted in the figure below. Among T2 and T3, which trophic level will have the maximum amount of energy? Give reasons for your answer. 2



- 25 State the laws of refraction of light. 2

OR

Define absolute refractive index and write an expression for it, by stating the significance of each symbol.

- 26 a) Name a contraceptive device which is effective in avoiding pregnancy and also prevents sexually transmitted diseases. 2
b) Give reasons - why sex-selective abortion is prohibited by law in India?

SECTION – C

Q.no. 27 to 33 are short answer questions.

- 27 A compound 'X' of sodium is used as an antacid and it decomposes on strong heating. 3
a) Name the compound 'X' and give its chemical formula.
b) Write a balanced chemical equation to represent the decomposition of 'X'.
c) Give one use of compound 'X' besides an antacid.
- 28 a) Balance the equation given below: 3
$$\text{Mg}_3\text{N}_2 + \text{H}_2\text{O} \longrightarrow \text{Mg}(\text{OH})_2 + \text{NH}_3$$

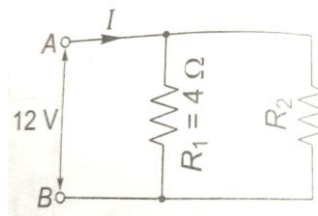
b) Ankit dissolved anhydrous copper sulphate and hydrated copper sulphate in water in the test tubes labelled 'A' and 'B' respectively. What changes do you expect in these test tubes?
c) Write chemical formula of hydrated and anhydrous salt of copper sulphate.
- 29 Write the physical characteristics of F1 and F2 progeny, when RRyy (Round and Green seeds) plant 3
is crossed with rrYY (wrinkled and Yellow seeds) plant. Also mention the ratio of various traits obtained in the F2 generation.

OR

Plant bearing purple colored flowers was crossed with plant bearing white color flowers. The offspring produced as a result of this cross (F1 generation) was selfed. It was observed that in F2 generation, 75% of the flowers were purple.

- a) Depict F1 and F2 generation with the help of a cross
b) If 200 plants are produced in F2 generation, how many plants would be of pure dominant trait and pure recessive trait respectively?
- 30 A person uses spectacles of focal length -2.5m. 3
a) Name the defect of vision he is suffering from and the type of lens required for the correction of this defect.
b) Compute the power of the lens used by the person.
c) List two main causes of this defect.

- 31 Isha has two resistors 2Ω and 3Ω . She has to connect one of them in place of R_2 as shown in the circuit. The current required in the circuit is $9A$. Which one will she choose and why? 3



- 32 Which of the two has greater resistance when both are operated on $230V$:
 a) $1kW$ heater b) $100W$ tungsten bulb. Give reason for your answer. 3

OR

Sketch the pattern of magnetic field lines of a current-carrying solenoid and explain why two magnetic field lines never intersect each other.

- 33 Represent and explain the process for formation of ozone at higher level of atmosphere? What will be the effect of depletion of ozone layer on the earth and human beings? 3

SECTION – D

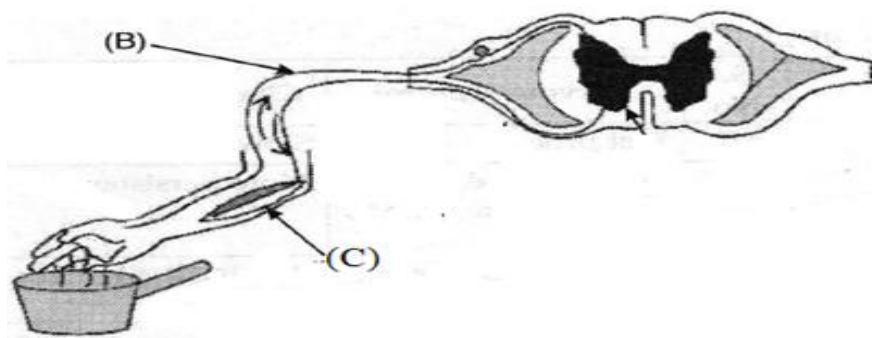
Q.no. 34 to 36 are long answer questions

- 34 a) What is the general formula of ketonic group. Write the structural formula of the first homologous member of ketone group. 5
 b) Write the molecular formula of first two consecutive members of homologous series of aldehyde group.
 c) Why do members of homologous series exhibit similar chemical properties?
 d) Show the formation of the 2nd member of alkene group by electron dot structure.

OR

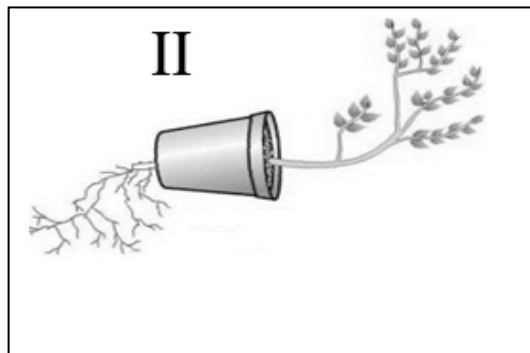
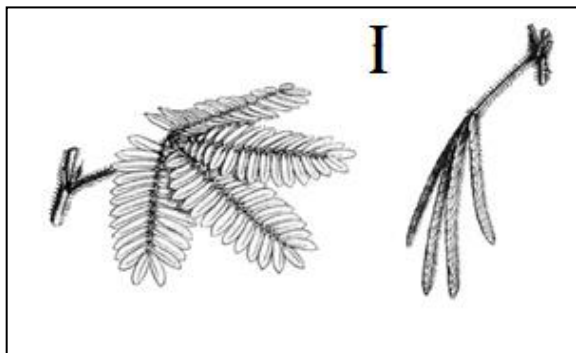
An organic compound 'A' having molecular formula C_2H_6O , on heating with concentrated sulphuric acid forms a compound 'B' which on addition of 1 mole of hydrogen in the presence of nickel as a catalyst forms a compound 'C'. Write the structural formula of compounds 'A', 'B' and 'C' and also write the chemical equations involved.

- 35 a) Why chemical communication is considered better than an electric impulse between cells in a multi-cellular organism? 5
 b) In the given diagram of the reflex arc name the parts labelled, as B and C and give their functions respectively.



OR

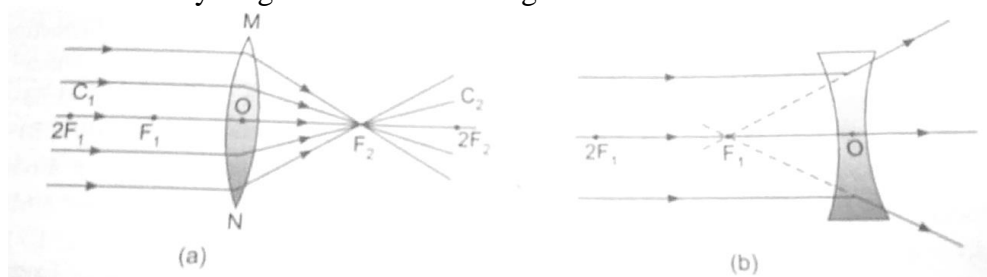
a) Identify, name and give two differences between the kinds of movement shown in diagrams I and II.



b) What is the role of Cytokinin and Abscisic acid in plants?

36 Observe the ray diagrams of two lenses given below and answer the following questions.

5



- What is the name given to the points F_2 of figure (a) and F_1 of figure (b)?
- Why the positions of these two points are different in the above case?
- State one application of lens type (a) and (b) respectively.
- Distinguish between the lenses of the ray diagram (a) and (b) on the basis of the following:
 - Construction
 - Function

SECTION – E

Q.no. 37 to 39 are case-based/data-based questions with 2 to 3 short sub-parts. Internal choice is provided in one of these sub-parts.

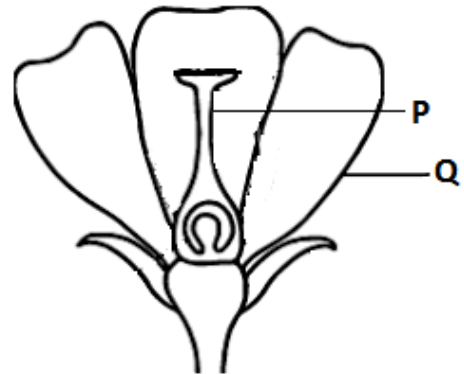
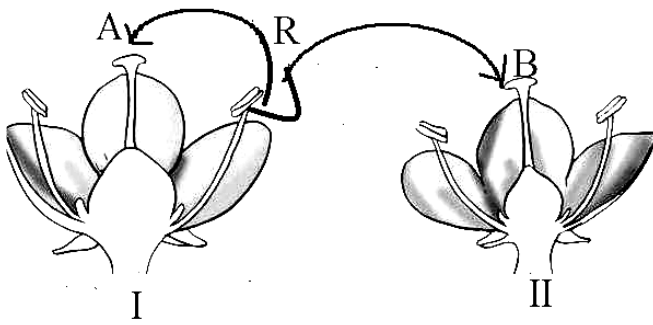
- 37** The metals like iron, zinc, lead etc., are moderately reactive metals. These are usually present as sulphides or carbonates ores in nature. It is easier to obtain a metal from its oxide, therefore sulphide and carbonate ores are converted to their corresponding oxide for easy extraction of metal. The sulphide ores are converted into oxides by heating strongly in the presence of excess air. This process is known as roasting. The carbonate ores are changed into oxides by heating strongly in limited air. This process is known as calcination.
- Write chemical equation showing formation of copper from copper sulphide.
 - What is the chemical formula of cinnabar?
 - Why are some metals present in free state and some in combined state in the earth crust? Give any one example of metal present in free state as well as in combined state.

OR

Give an application of thermit reaction. Also write chemical equation of the same reaction.

- 38 Refer to the diagrams shown below: A substance labelled R is transferred to parts A and B, in flowers I and II respectively. R is not transferred to flower III. It is later observed that growth of a tube takes place from the substance which travels down the pistil to form a zygote.

4



III

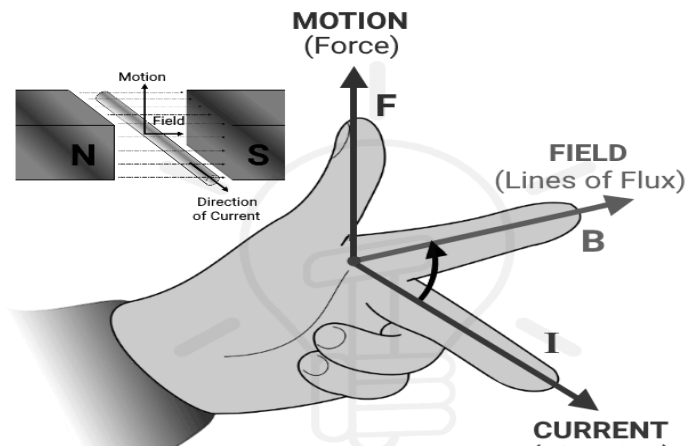
- Name the substance R and part A/B in flower.
- Name the parts P and Q in flower III and write the function of part Q.
- Will fruit formation take place in the flower III. Give a reason to support your answer.

OR

- How is the transference of substance R in flower I and flower II different from each other?

- 39 When a current-carrying conductor is kept in a magnetic field, a force acts on it due to the interaction of magnetic field lines. The direction of this force can be determined by using Fleming's Left-Hand Rule. This rule doesn't define magnitude; rather, demonstrates the direction of the three parameters (magnetic field, current, and force). Fleming's Left-hand Rule states that if we stretch the thumb, middle finger and the index finger of the left hand in such a way that they make an angle of 90° degrees (Perpendicular to each other) and the conductor placed in the magnetic field experiences magnetic force.

4



- If the electrons are travelling from South to North direction in a conductor when placed in a magnetic field and the directions of magnetic field line are from west to east. What would be the direction of force on the conductor?
- If the charged particles are moving along a magnetic field line, what would be the magnetic force on the particles?
- Mention the two ways by which magnitude of the force can be changed.

OR

- What result would you expect, if the magnitude of the current in the conductor will increase? Give reason for your answer.