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Reg. No.: | | | | | | |

THIRD REVISION COMMON EXAMINATION - 2025

Std - X

SCIENCE

Time : 3.00 Hours **Marks:75**

Part - I

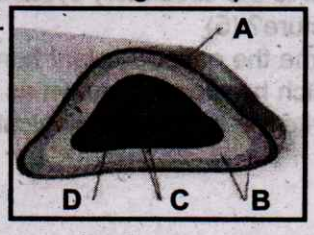
Answer all the questions: **12 x 1 = 12**

1. Power of a lens is -4D, then its focal length is
   a) 4m b) -40m c) -0.25m d) -2.5m
2. Which is the highest resistivity conductor .....
   a) Nichrome b) Nickel c) Tungsten d) Copper
3. Proton - Proton chain reaction is an example of .....
   a) Nuclear fission b) α-decay c) Nuclear fusion d) β-decay
4. The gram molecular mass of oxygen molecule is
   a) 16 g b) 18 g c) 32g d) 17g
5. ..... is an important metal to form amalgam.
   a) Ag b) Hg c) Mg d) Al
6. Which among the following is in the correct ascending order based on reactivity?
   a) potassium, platinum, lead, silver b) platinum, silver, lead, potassium
   c) silver, lead, platinum, potassium d) lead, silver, potassium, platinum
7. Oxygen is produced at which point during photosynthesis?
   a) When ATP is converted to ADP b) When CO_2 is fixed
   c) When H_2O is splitted d) all of these
8. The wall of human heart is made of
   a) Endocardium b) Epicardium c) Myocardium d) all of the above
9. The pollination with the help of wind is termed as .....
   a) anemophily b) entomophily c) hydrophily d) zoophily
10. Paleontologists deal with
    a) Embryological evidences b) Fossil evidences
    c) Vestigial organ evidences d) all the above
11. Cancer of the epithelial cells is called
    a) Leukemia b) Sarcoma c) Carcinoma d) Lipoma
12. Which software is used to create animation?
    a) paint b) PDF c) MS Word d) Scratch

Part - II

Answer any 7 of the following questions. (Question No. 22 is compulsory) 7 x 2 = 14

13. State Newton's second law.
14. What happens to the resistance, as the conductor is made thicker?
15. What is rust? Give the equation for formation of rust.
16. A hot saturated solution of copper sulphate forms crystals as it cools. Why?
17. Differentiate reversible and irreversible reactions?
18. Why should the light dependent reaction occur before the light independent reaction?
19. Draw the following diagram and mention its part.



20. What are heart sounds? How are they produced?
21. State the applications of DNA finger printing technique.
22. An electric heater of resistance 5Ω is connected to an electric source. If a current of 6A flows through the heater, then find the amount of heat produced in 5 minutes.

Part - III

Answer any 7 of the following questions (Question No. 32 compulsory): 7 x 4 = 28

23. What are the types of inertia? Give an example for each type?
24. a) State Boyle's law. (2)
    b) What connection is used in domestic appliances and why? (2)
25. a) Why does sound travel faster on a rainy day than on a dry day? (2)
    b) What are the medical applications of echo?
26. Write any 4 salient features of Modern atomic theory.
27. Write notes on a) Saturated solution b) Unsaturated solution
28. a) What is transpiration?
    b) Transpiration is a necessary evil in plants explain.
29. Define ethnobotany and write its importance.
30. a) Why is euploidy considered to be advantageous to both plants and animals? (2)
    b) Pure-bred tall pea plants are first crossed with pure-bred dwarf pea plants. The pea plants obtained in F_1 generation are then cross-bred to produce F_2 generation of pea plants. (2)
    a) What do the plants of F_1 generation look like?
    b) What is the ratio of tall plants to dwarf plants in F_2 generation?
31. What are the advantages of using biogas.
32. An organic compound 'A' is widely used as a preservative and has the molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compound 'B'.
    a) Identify the compound 'A'.
    b) Write the chemical equation for its reaction with ethanol to form compound 'B'.
    c) Name the process.

Part - IV

Answer all the questions. Draw diagrams wherever it is needed. 3 x 7 = 21

33. a) i) Explain the rules for obtaining images formed by a convex lens with the help of ray diagram. (6)
    ii) What is the least distance of a distinct vision of human eye? (1) **(OR)**
    b) i) Compare the properties of alpha, beta and gamma radiations. (5)
    ii) What is stellar energy? (2)
34. a) Define corrosiion. What are the methods of preventing corrosion? **(OR)**
    b) i) Explain the types of double displacement reactions with examples. (4)
    ii) Match the following (3)

Reaction	Type
a) $Zn + CuSO_4 \longrightarrow ZnSO_4 + Cu$	- Combustion
b) $ZnCO_3 \xrightarrow{Heat} ZnO + CO_2$	- Single displacement
c) $C_2H_4 + 4O_2 \longrightarrow 2CO_2 + 2H_2O + Heat$	- Thermal decomposition

35. a) i) How does leech suck blood from the host?
    ii) How is the circulatory system designed in leech to compensate the heart structure? (5) **(OR)**
    b) i) Name the gaseous plant hormone. Describe its two different actions in plants. (2)
    ii) Which hormone is known as stress hormone in plants? Why? (2)
    iii) Write the three physiological effects of gibberellins. (3)

Common Second Revision Exam 2025 (Thoothukudi District)

Answer Key – Grade X Science

Part I

1) Power of a lens is –4D, then its focal length is **–0.25 m (Option c)**

2) Which is the highest resistivity conductor? **Option a - Nichrome**

3) **Proton-Proton chain reaction** is an example of **Nuclear Fusion (Option C)**

4) The gram molecular mass of oxygen molecule is **32g** **(Option c)**

5) **Hg** is an important metal to form amalgam. **Option b**

6) Which among the following is in the correct ascending order based on reactivity ?
b)platinum , silver, lead, potassium (Option b)

7) Oxygen is produced at which point during photosynthesis?

c) When H_2O is split .

8) The wall of the human heart is made of **Endocardium, Epicardium and Myocardium.**

d) All of the above

9) The pollination with the help of wind is called **anemophily**. (Option a)

10) Paleontologists deal with **Fossil evidences (Option b)**

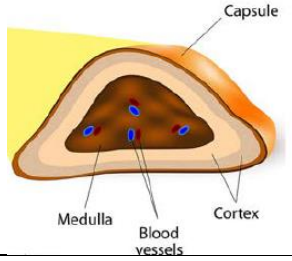
11) Cancer of the epithelial cells is called **Carcinoma (Option c)**

12) Which software is used to create animation?**d) Scratch**

Part 2

Question No	Question and Answer	Marks
13	**State Newton's Second Law.** Newton's second law states that "the force acting on a body is directly proportional to the rate of change of linear momentum of the body and the change in momentum takes place in the direction of the force."	2
14	**What happens to the resistance, as the conductor is made thicker?** The resistance **decreases** as the resistance is **inversely proportional** to the **area of cross section.**	2
15	**What is rust? Give the equation for formation of rust.** When iron is **exposed to moist air**, it forms a **layer of brown hydrated ferric oxide** on its surface. This compound is known as **rust** and the **phenomenon** of formation of rust is known as **rusting**. $Fe + 3\ O_2 + x\ H_2O \rightarrow 2\ Fe_2O_3 . xH_2O$(rust)	Rust -1 Equation - 1
16	**A hot saturated solution of copper sulphate forms crystals as it cools. Why?** As the solution cools, the solubility of copper sulphate **decreases**, causing the excess solute to crystallize out.	2
17	**Differentiate reversible and irreversible reactions**	2(Any two points)

REVERSIBLE REACTION	IRREVERSIBLE REACTION
It can be reversed under suitable conditions.	It cannot be reversed.
Both forward and backward reactions take place simultaneously.	It is unidirectional. It proceeds only in forward direction.
It attains equilibrium.	Equilibrium is not attained.

	The reactants cannot be converted completely into products.	The reactants can be completely converted into products.	
	It is relatively slow.	It is fast.	
18	**Why should the light-dependent reaction occur before the light-independent reaction?** • The light-dependent reaction **produces ATP and NADPH**, which are **needed** for the **light-independent reaction (Calvin cycle).** • **Without ATP and NADPH**, the light-independent reaction **cannot occur**, as these molecules **provide the energy** and **reducing power** to convert carbon dioxide into glucose.		1 1
19	A : Capsule B: Cortex C: Blood vessels D: Medulla  		0.5 0.5 0.5 0.5
20	**What are heart sounds? How are they produced?** The **rhythmic closure and opening** of the **valves** cause the **sound of the heart**. Heart sounds are the "LUBB" and "DUBB" sounds. The **"LUBB" sound** is produced by the **closure of the bicuspid and tricuspid valve**s, and the **"DUBB" sound** is produced by the **closure of the semilunar valves.**		2
21	**Applications of DNA Fingerprinting** **i.** DNA fingerprinting technique is widely used in forensic applications like crime investigation such as identifying the culprit. It is also used for paternity testing in case of disputes. ii. It also helps in the study of genetic diversity of population, evolution and speciation.		1 1
22	**An electric heater of resistance 5 Ω is connected to an electric source. If a current of 6 A flows through the heater, then find the amount of heat produced in 5 minutes.** Solution: Given resistance R = 5 Ω, Current I = 6 A, Time t = 5 minutes = 5 × 60 s = 300 s Amount of heat produced, H = I2Rt, H = 62 × 5 × 300. Hence**, H = 54000 J**		1 1

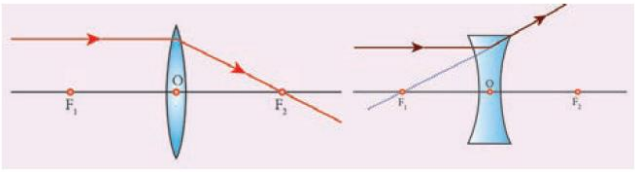
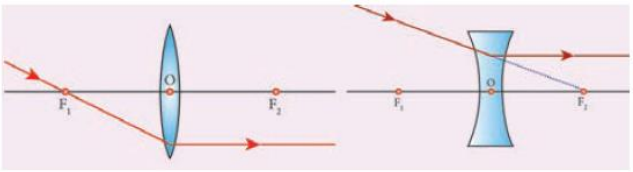
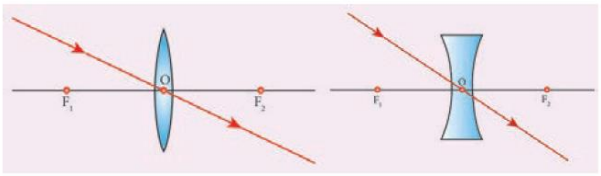
Part III (4 marks)

Q No	Question and Answer	Marks
23)	1. **Types of inertia with examples** Inertia is the **inherent property** of a body to **resist any change** in its **state of rest or uniform motion** unless acted upon by an **external force**. o **Inertia of rest:** The resistance of a body to change its state of rest is called inertia of rest. **Example :** When you vigorously shake the branches of a tree, some of the leaves and fruits are detached and they fall down, o **Inertia of motion**: The resistance of a body to change its state of motion is called inertia of motion. **Example** : An athlete runs some distance before jumping. Because, this will help him jump longer and higher. o **Inertia of direction:** The resistance of a body to change its direction of motion is called inertia of direction. **Example :** When you make a sharp turn while driving a car, you tend to lean sideways.	1 1 1 1

24)a)	**State Boyle's law:** At **constant temperature**, the **pressure** of a **given mass** of **gas is inversely proportional** to its **volume**. $P \propto \frac{1}{V}$ or $PV = \text{constant}$	1 1
24)b)	**What connection is used in domestic appliances and why?** **Parallel connection** is used so that each domestic appliance can work independently. • The disconnection of one circuit does not affect the other circuit • Each electric appliance gets an equal voltage.	1 1 1
25)a)	**Why does sound travel faster on a rainy day than on a dry day?** When **humidity increases**, the **speed of sound increases**. Sound travels faster in **humid air** because the **humidity increases** the water vapour content, making the **air less dense** and allowing sound to **propagate** more **easily**. That is why you can hear sound from long distances clearly during rainy seasons	1 1
b)	**What are the medical applications of echo?** The principle of echo is used in **obstetric ultrasonography**, which is used to create real-time visual images of the developing embryo or fetus in the mother's uterus. This is a safe testing tool, as it does not use any harmful radiations.	1 1
26)	Give the salient features of "Modern atomic theory". • **An atom is no longer indivisible** (after the discovery of the electron, proton, and neutron). • Atoms of the **same element** may have **different atomic mass**. (discovery of **isotopes** $_{17}Cl^{35}$, $_{17}Cl^{37}$). • Atoms of **different elements** may have **same atomic masses** (discovery of **Isobars** $_{18}Ar^{40}$, $_{20}Ca^{40}$). • Atoms of one element can be **transmuted into atoms** of other elements. • Atoms may not always combine in a simple whole number ratio (E.g. Glucose $C_6H_{12}O_6$ C:H:O = 6:12:6 or 1:2:1) • Atom is the **smallest particle** t**hat takes part in a chemical reaction.** • The **mass** of an atom can be **converted into energy** ($E = mc^2$).	Any 4 points - 4
27)	i) **Saturated Solution:** A solution in which **no more solute can be dissolved** in a definite amount of solvent at a given temperature is called a **saturated solution**. **Example**: 36 g of sodium chloride dissolves in 100 g of water at 25°C to form a saturated solution. ii) **Unsaturated Solution:** A solution that contains **less solute than a saturated solution** at a given temperature is called an **unsaturated solution**. **Example**: 20 g of sodium chloride in 100 g of water at 25°C forms an unsaturated solution	1 1 1 1
28)a	What is Transpiration ? **Transpiration** is the **evaporation of water** from the **aerial parts** of the plant especially through stomata in leaves.	2
28) b	**Transpiration is a necessary evil in plants. Explain.** **Answer: Transpiration** is the process of water loss through the stomata in the leaves. It is necessary for the plant because it helps: • In the uptake of water and nutrients from the soil. • Cooling the plant by releasing water vapor. • Maintaining the flow of water through the plant system. However, it is sometimes considered a "necessary evil" because excessive transpiration can lead to water loss and dehydration in plants, especially under dry conditions.	2

29)	**Define Ethnobotany and write its importance.** Ethnobotany is the study of a region's plants and their practical uses through the traditional knowledge of the local culture of people. **Importance of Ethnobotany** 1) It provides traditional uses of plant. 2) It gives information about certain unknown and known useful plants. 3) The ethno medicinal data will serve as a useful source of information for the chemists, pharmacologists and practitioners of herbal medicine. 4) Tribal communities utilize ethno medicinal plant parts like bark, stem, roots, leaves, flower, bud, flowers, fruits, seeds, oils, resins, dyes, gum for the treatment of diseases like diarrhea, fever, headache, diabetes, jaundice, snakebites, leprosy, etc.	1 1 1 1
30)a)	**Why is euploidy considered to be advantageous to both plants and animals?** • Euploidy is the **condition** in which the individuals bears more than the usual number of diploid (2n) Chromosomes • Euploidy Plants are advantageous as they often result in increased fruit and flower size. • In animals, the triploid oyster is bigger in size than the diploid oyster.	1 1
30)b)	**Pure-bred tall pea plants are first crossed with pure-bred dwarf pea plants. The pea plants obtained in F1 generation are then selfed to produce F2 generation of pea plants.** **a. What do the plants of F1 generation look like?** • The F1 generation plants were tall. **b. What is the ratio of tall plants to dwarf plants in F2 generation?** Phenotype Ratio = 3: 1 Tall: Dwarf Genotype Ratio = 1: 2: 1 Tall Tall Dwarf (Homozygous) (Heterozygous) (Homozygous) TT Tt tt	1 1
31)	**Advantages of biogas** (i) It burns without smoke and therefore causes less pollution. (ii) An excellent way to get rid of organic wastes like bio-waste and sewage material. (iii) Left over slurry is a good manure rich in nitrogen and phosphorus (iv) It is safe and convenient to use (v) It can reduce the amount of greenhouse gases emitted.	4 (Any 4 points)
32)	**An organic compound 'A' is widely used as a preservative and has the molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet-smelling compound 'B'.** **(i) Identify the compound 'A':** The compound **'A'** is **Ethanoic acid (CH_3COOH)**. **(ii) Write the chemical equation for its reaction with ethanol to form compound 'B':** The reaction is: $C_2H_5OH + CH_3COOH \xrightarrow{conc.H_2SO_4} CH_3COOC_2H_5 + H_2O$ Ethanol Ethanoic acid Ethyl ethanoate Here, **$CH_3COOC_2H_5$** is the sweet-smelling compound **Ethyl ethanoate**. **(iii) Name the process:** The process is **Esterification**.	1 2 1

Part IV

<table>
<tr><th>Question No</th><th>Question & Answer</th><th>Marks</th></tr>
<tr><td>33)a)i)</td><td>2. Explain the rules for obtaining images formed by a convex lens with the help of ray diagrams:
Rule 1: A ray of light parallel to the principal axis, after refraction through a convex lens, passes through the principal focus on the other side.
 
Rule 2: A ray of light passing through the principal focus, after refraction, emerges parallel to the principal axis.
 
Rule 3: A ray of light passing through the optical center of the lens continues to travel in a straight line without any deviation.
 
These rules help to determine the position, size, and nature of the image formed by a convex lens.</td><td>2
2
2</td></tr>
<tr><td>33)a)ii</td><td>What is the least distance of a distant vision of a human eye?
The minimum distance required to see the objects distinctly without strain is called least distance of distinct vision. It is 25 cm for normal human eye.</td><td>1</td></tr>
<tr><td>33)b)i)</td><td>
<table>
<tr><th>α rays</th><th>β rays</th><th>γ rays</th></tr>
<tr><td>Helium nucleus ($_2He^4$) consisting of two protons and two neutrons.</td><td>They are electrons ($_{-1}e^0$), basic elementary particle in all atoms.</td><td>They are electromagnetic waves consisting of photons.</td></tr>
<tr><td>Positively charged particles.
Charge of each alpha particle = +2e</td><td>Negatively charged particles.
Charge of each beta particle = –e</td><td>Neutral particles.
Charge of each gamma particle = zero</td></tr>
<tr><td>100 time greater than β rays and 10,000 times greater than γ rays</td><td>Comparatively low</td><td>Very less ionization power</td></tr>
<tr><td>Low penetrating power (even stopped by a thick paper)</td><td>Penetrating power is greater than that of α rays. They can penetrate through a thin metal foil.</td><td>They have a very high penetrating power greater than that of β rays. They can penetrate through thick metal blocks.</td></tr>
<tr><td>Deflected by both the fields. (in accordance with Fleming's left-hand rule)</td><td>Deflected by both the fields; but the direction of deflection is opposite to that for alpha rays. (in accordance with Fleming's left-hand rule)</td><td>They are not deflected by both the fields.</td></tr>
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1
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1
1</td></tr>
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	Their speed ranges from 1/10 to 1/20 times the speed of light.	Their speed can go up to 9/10 times the speed of light.	They travel with the speed of light.

ii) **What is stellar energy?** — 2

Answer: Energy produced by nuclear fusion reactions in stars and sun is called Stellar energy.

34)a **What is Corrosion? What are the methods of preventing corrosion?** — 2

It is the gradual destruction of metals by chemical or electrochemical reaction with the environment. It is a natural process which converts a metal into its oxide, hydroxide or sulphide so that it loses its metallic characteristics.

Methods of preventing corrosion — 5

i. Alloying: The metals can be alloyed to prevent from the process of corrosion. E.g: Stainless Steel

ii. Surface Coating: It involves application of a protective coating over the metal. It is of the following types:

a) Galvanization: It is the process of coating zinc on iron sheets by using electric current.

b) Electroplating: It is a method of coating one metal over another metal by passing electric current.

c) Anodizing: It is an electrochemical process that converts the metal surface into a decorative, durable and corrosion resistant. Aluminium is widely used for anodizing process.

d) Cathodic Protection: It is the method of controlling corrosion of a metal surface protected is coated with the metal which is easily corrodible. The easily corrodible metal is called Sacrificial metal to act as anode ensuring cathodic protection.

34)b)i) **Explain the types of double displacement reactions with examples.** — 1

When two compounds react, if their ions are interchanged, then the reaction is called double displacement reaction. The ion of one compound is replaced by the ion of the another compound. Double displacement reactions occur when ions from two compounds exchange places. There are two main types: — 1

- **Precipitation Reactions**: A solid (precipitate) forms when two solutions containing soluble salts are mixed. The precipitate forms because it is insoluble in water. For instance: — 1.5

  $Na_2SO_{4(aq)} + BaCl_{2(aq)} \rightarrow BaSO_{4(s)} \downarrow + 2NaCl_{(aq)}$ — 1.5

- **Neutralization Reactions**: These reactions occur when an acid reacts with a base to produce water and a salt. For example:

  $HCl_{(aq)} + NaOH_{(aq)} \rightarrow NaCl_{(aq)} + H_2O_{(l)}$

  In this reaction, hydrochloric acid reacts with sodium hydroxide to form sodium chloride (salt) and water.

ii)
- $Zn + CuSO_4 \rightarrow ZnSO_4 + Cu$ - Single Displacement — 1
- $ZnCO_3 \rightarrow ZnO + CO_2$ - Thermal Decomposition — 1
- $C_2H_4 + O_2 \rightarrow CO_2 + H_2O$ – Combustion — 1

35)a)i) **How does leech suck blood from the host?** — 2

Leech sucks blood using its **muscular pharynx** and secretes **hirudin** to prevent blood clotting

35)a)ii) **How is the circulatory system designed in leech to compensate for the heart structure?**

- In leech, the circulatory system is a **haemocoelic system** as there are **no true blood vessels**. — 1
- The **coelomic fluid acts as blood** and contains **hemoglobin**.
- There are **four longitudinal channels**: — 1
  - **Dorsal channel**: **Lies above** the alimentary canal.

	▪ **Ventral channel: Lies below** the alimentary canal. ▪ **Two lateral channels**: Act as hearts and contain valves to regulate blood flow. o These channels are interconnected posteriorly, and the **lateral channels** ensure circulation throughout the body.	1 1 1
35)b)i)	**(a) Name the gaseous plant hormone. Describe its three different actions in plants.** **Answer:** Ethylene. **Actions:** o Ethylene promotes the ripening of fruits eg: Tomato, Apple, Mango, Banana, etc. o Ethylene inhibits the elongation of stem and root in dicots. o Ethylene hastens the senescence of leaves and flowers. o Ethylene stimulates formation of abscission zone in leaves, flowers and fruits. This leads to premature shedding. o Ethylene breaks the dormancy of buds, seeds and storage organs. **ii) Which hormone is known as the stress hormone in plants? Why?** **Answer:** Abscisic acid (ABA). **Reason:** Abscisic acid (ABA) is the stress hormone. Because it increases tolerance of plants to various kinds of stress. So, it is called as stress hormone	1 1 1 1
35)b)iii)	**Write the physiological effects of gibberellins.** **Answer:** o Application of gibberellins on plants stimulate extraordinary elongation of internode. eg: Corn and Pea. o Treatment of rosette plants with gibberellin induces sudden shoot elongation followed by flowering. This is called bolting. o Gibberellins promote the production of male flowers in monoecious plants (Cucurbits). o Gibberellins break dormancy of potato tubers. o Gibberellins are efficient than auxins in inducing the formation of seedless fruit - Parthenocarpic fruits (Development of fruits without fertilization) eg: Tomato.	1 1 1