

Common First Revision Exam 2025 (Thoothukudi District)

Answer Key – Grade X Science

Part I

- 1) The unit of 'g' is m/s^2 . It can also be expressed as **Nkg^{-1} (Option b)**
- 2) Temperature is the average _____ of the molecules of a substance is **difference in T.E and P.E (Option C)**
- 3) If n resistors of equal resistance are connected in series and then in parallel then the ratio of their effective resistance will be **$n^2:1$ (Option b)**
- 4) In the nucleus of ${}_{20}Ca^{40}$, there are **20 protons and 20 neutrons (Option b)**
- 5) Which of the following is the Halide ore? **NaCl (Option c)**
- 6) A 25% alcohol solution means **25 ml alcohol in 75 ml of water. (Option c)**
- 7) Kreb's cycle takes place in **Mitochondrial matrix (Option b)**
- 8) Decreased number of WBC is called as **Leukopenia (Option c)**
- 9) **A. Nissl's granules - Cytosol**
B. Hypothalamus - Forebrain
C. Cerebellum - Hindbrain
D. Schwann cell - Peripheral Nervous System (Option a)
- 10) Avena coleoptiles test was conducted by **F.W. Went (Option d)**
- 11) What is true of gametes? **They are formed from gonads (Option d)**
- 12) 9:3:3:1 ratio is due to **Independent assortment (Option c)**

Part 2

Question No	Question and Answer	Marks												
13	Define moment of a couple. <ul style="list-style-type: none"> • Rotating effect of a couple is known as moment of a couple. • It is measured by the product of any one of the forces and the perpendicular distance between the line of action of two forces. • Moment of a couple = Force \times perpendicular distance between the line of action of forces $M = F \times S$	1 1												
14	State Ohm's law. Ohm's law states that "The current (I) flowing through a conductor is directly proportional to the voltage (V) across it and inversely proportional to its resistance (R) ". Formula: $V=I \times R$	1 1												
15	Write the different types of isotopes of oxygen and its percentage abundance. <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>Isotope</th> <th>Mass (amu)</th> <th>% abundance</th> </tr> </thead> <tbody> <tr> <td>${}^8O^{16}$</td> <td>15.9949</td> <td>99.757</td> </tr> <tr> <td>${}^8O^{17}$</td> <td>16.9991</td> <td>0.038</td> </tr> <tr> <td>${}^8O^{18}$</td> <td>17.9992</td> <td>0.205</td> </tr> </tbody> </table>	Isotope	Mass (amu)	% abundance	${}^8O^{16}$	15.9949	99.757	${}^8O^{17}$	16.9991	0.038	${}^8O^{18}$	17.9992	0.205	Isotopes : 1 % abundance : 1
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16	Define Amalgam and give an example An amalgam is an alloy of mercury with another metal.	1												

	These alloys are formed through metallic bonding with the electrostatic force of attraction between the electrons and the positively charged metal ions. Silver tin amalgam is used for dental filling.	1
17	Define Hydrated salt. A hydrated salt is a salt that contains a definite number of water molecules (water of crystallization) as part of its crystalline structure.	2
18 a	How does leech respire? Leeches respire through their skin by diffusion of gases.	1
18 b	What does CNS stand for? CNS stands for Central Nervous System .	1
19	Why is the Sinoatrial node called the pacemaker of the heart? <ul style="list-style-type: none"> The sino-atrial node (SA node) is called the pacemaker of the heart because it initiates the impulse that makes the heart muscles contract. The impulse from the SA node spreads as a wave of contraction over the right and left atrial walls, pushing blood through the atrioventricular valves into the ventricles. This wave of contraction then reaches the atrioventricular node (AV node), which emits another impulse for contraction. The impulse from the AV node travels to the ventricular muscles through the atrioventricular bundle and the Purkinje fibers, causing the ventricles to contract. 	1 1
20	A:BILE DUCT B:ACINAR CELLS C:PANCREATIC DUCT D:DUODENUM	2
21	What do you understand by the term phenotype and genotype? <ul style="list-style-type: none"> Phenotype: External expression of a particular trait is known as phenotype. Genotype: Genetic expression of an organism is known as genotype. 	1 1
22	A person with myopia can see objects placed at a distance of 4m. If he wants to see objects at a distance of 20m, what should be the focal length and power of the concave lens he must wear? Solution: Given that $x = 4\text{m}$ and $y = 20\text{m}$. Focal length of the correction lens is $f = \frac{-xy}{x-y} \quad (\text{Refer eqn.2.7})$ $f = \frac{4 \times 20}{4 - 20} = \frac{80}{-16} = -5 \text{ m}$ Power of the correction lens $= \frac{1}{f} = -\frac{1}{5} = -0.2 \text{ D}$	1 1

Part III (4 marks)

Q No	Question and Answer	Marks
23)	Newton's laws of motion Newton's First Law : This law states that every body continues to be in its state of rest or the state of uniform motion along a straight line unless it is acted upon by some external force. It gives the definition of force as well as inertia . Newton's Second Law : According to this law, " 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 ".	1 1

	This law helps us to measure the amount of force . So, it is also called as ' law of force '. Newton's Third Law : It states that 'for every action, there is an equal and opposite reaction. They always act on two different bodies'	1																								
24)a)	State Boyle's law: At constant temperature , the pressure of a given mass of gas is inversely proportional to its volume . $P \propto \frac{1}{V} \quad \text{or} \quad PV = \text{constant}$	1 1																								
24)b)	<table border="1"> <thead> <tr> <th>Ideal Gas</th> <th>Real Gas</th> </tr> </thead> <tbody> <tr> <td>If the atoms or molecules of a gas do not interact with each other, then the gas is said to be an ideal gas or a perfect gas.</td> <td>If the molecules or atoms of a gases interact with each other with a definite amount of intermolecular or inter atomic force of attraction, then the gases are said to be real gases</td> </tr> <tr> <td>Obeys the gas laws at all conditions.</td> <td>Deviates from gas laws under high pressure or low temperature.</td> </tr> <tr> <td>No intermolecular forces.</td> <td>Has intermolecular forces.</td> </tr> </tbody> </table>	Ideal Gas	Real Gas	If the atoms or molecules of a gas do not interact with each other, then the gas is said to be an ideal gas or a perfect gas .	If the molecules or atoms of a gases interact with each other with a definite amount of intermolecular or inter atomic force of attraction, then the gases are said to be real gases	Obeys the gas laws at all conditions.	Deviates from gas laws under high pressure or low temperature.	No intermolecular forces.	Has intermolecular forces.	1 1																
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25)a)	State Joule's law of heating. Joule's Law of Heating states that the heat produced in a resistor is directly proportional to: <ol style="list-style-type: none"> The square of the current (I^2) The resistance of the resistor (R) The time for which the current flows (t) Formula: $H=I^2Rt$	1 1																								
b)	An alloy of nickel and chromium is used as the heating element. Why? Nickel-chromium (Nichrome) alloy is used because it has: <ul style="list-style-type: none"> High resistivity (produces more heat). High melting point (does not melt easily). Does not oxidize quickly at high temperatures. 	1 1																								
26)a)	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 . $4 \text{Fe} + 3 \text{O}_2 + x \text{H}_2\text{O} \rightarrow 2 \text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}(\text{rust})$	1 1																								
26)b)	State two conditions necessary for rusting of iron. <ol style="list-style-type: none"> Presence of moisture (water) Presence of oxygen 	1 1																								
27)	Differentiate Monocot and Dicot root : <table border="1"> <thead> <tr> <th>SNo.</th> <th>Tissues</th> <th>Dicot Root</th> <th>Monocot Root</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>Number of Xylem</td> <td>Tetrarch</td> <td>Polyarch</td> </tr> <tr> <td>2</td> <td>Cambium</td> <td>Present (During secondary growth only)</td> <td>Absent</td> </tr> <tr> <td>3</td> <td>Secondary Growth</td> <td>Present</td> <td>Absent</td> </tr> <tr> <td>4</td> <td>Pith</td> <td>Absent</td> <td>Present</td> </tr> <tr> <td>5</td> <td>Conjunctive Tissue Ex.</td> <td>Parenchyma Bean</td> <td>Sclerenchyma Maize</td> </tr> </tbody> </table>	SNo.	Tissues	Dicot Root	Monocot Root	1	Number of Xylem	Tetrarch	Polyarch	2	Cambium	Present (During secondary growth only)	Absent	3	Secondary Growth	Present	Absent	4	Pith	Absent	Present	5	Conjunctive Tissue Ex.	Parenchyma Bean	Sclerenchyma Maize	1 1 1 1 1 1
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28)	List out the parasitic adaptations in leech. The parasitic adaptations in leech are:	1																								

	<ul style="list-style-type: none"> Suckers: Anterior and posterior suckers help the leech attach to the host. Pharynx sucks blood from the host. Three jaws create a painless Y-shaped wound. Hirudin: Prevents blood clotting, ensuring a continuous blood supply. No Parapodia or Setae <p>Crop Storage: Blood stored in the crop provides nourishment for months, reducing the need for digestive enzymes</p>	1 1 1												
29)	<p>Our body contains a large number of cells 'L' which are the longest cells in the body. L has long and short branch called as 'M' and 'N' respectively. There is a gap 'O' between two 'L' cells, through which nerve impulse transfer by release of chemical substance 'P'.</p> <p>(i) L: Neurons. (ii) M: Axon; N: Dendrite. (iii) O: Synapse. (iv) P: Acetylcholine (Neurotransmitter)</p>	1 1 1 1												
30)a)	<p>What is bolting? How can it be induced artificially? Answer: Bolting is the rapid elongation of the stem before flowering, commonly seen in plants like cabbage. Induced by: Application of gibberellins. Explanation: Gibberellins break the dormancy of the stem, causing rapid elongation, especially in cold-season plants exposed to warmer conditions.</p>	1 1												
30)b)	<p>Write the differences between endocrine and exocrine glands. Answer:</p> <table border="1"> <thead> <tr> <th>Endocrine glands</th> <th>Exocrine glands</th> </tr> </thead> <tbody> <tr> <td>They secrete hormones</td> <td>They secrete enzymes, saliva and milk</td> </tr> <tr> <td>They are ductless glands</td> <td>They may have or may not have ducts</td> </tr> <tr> <td>They are transported through bloodstream</td> <td>They are transported through ducts or tubes</td> </tr> <tr> <td>They control long term activities</td> <td>They control short term activities</td> </tr> <tr> <td>Ex. Pituitary, thyroid, adrenal, etc.</td> <td>Ex. Salivary, gastric and sweat glands.</td> </tr> </tbody> </table>	Endocrine glands	Exocrine glands	They secrete hormones	They secrete enzymes, saliva and milk	They are ductless glands	They may have or may not have ducts	They are transported through bloodstream	They are transported through ducts or tubes	They control long term activities	They control short term activities	Ex. Pituitary, thyroid, adrenal, etc.	Ex. Salivary, gastric and sweat glands.	1 1
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31)	<p>A pure tall plant (TT) is crossed with pure dwarf plant (tt), what would be the F1 and F2 generations? Explain.</p> <p>F1 Generation:</p> <ul style="list-style-type: none"> Plants raised from the seeds of pure breeding parental cross in F1 generation were tall and Monohybrids. <p>F2 Generation:</p> <ul style="list-style-type: none"> Selfing of the F1 Monohybrids resulted in tall and dwarf plants in the ratio of 3 :1 In the F2 Generation 3 different types were obtained. <ul style="list-style-type: none"> Tall Homozygous - TT (pure) - 1 Tall Heterozygous - Tt - 2 Dwarf Homozygous - tt - 1 External expression of a particular trait is known as phenotype. Phenotypic ratio = 3:1. A Genotype is the genetic expression of an organism. Genotypic ratio = 1:2:1. 	1 1 1 1												
32)	<p>1. Calculate the number of water molecule present in one drop of water which weighs 0.18 g. Given : Mass of water = 0.18 g Molar mass of water (H₂O) = 18 g/mol Avogadro's number = 6.023×10^{23} molecules/mol</p>	1												

Number of moles of water: $\text{Moles of water} = \frac{\text{Mass of water}}{\text{Molar mass of water}}$	1
Number of molecules: $\text{Number of molecules} = \text{Moles} \times \text{Avogadro's number}$	
Calculate moles of water: $\text{Moles} = \frac{0.18 \text{ g}}{18 \text{ g/mol}} = 0.01 \text{ moles}$	1
Calculate number of molecules: $\text{Number of molecules} = 0.01 \times 6.023 \times 10^{23} = 6.023 \times 10^{21} \text{ molecules}$	1
Answer: There are 6.023×10^{21} water molecules in one drop of water.	

Part IV

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33)a)i)	Differentiate the eye defects: Myopia and Hypermetropia <table border="1"> <thead> <tr> <th>Feature</th> <th>Myopia (Shortsightedness)</th> <th>Hypermetropia (Longsightedness)</th> </tr> </thead> <tbody> <tr> <td>Definition</td> <td>Inability to see distant objects clearly. Nearby objects can be seen clearly</td> <td>Inability to see nearby objects clearly. Distant objects can be seen clearly.</td> </tr> <tr> <td>Cause</td> <td>Lengthening of eyeball</td> <td>Shortening of eyeball</td> </tr> <tr> <td>Image Formation</td> <td>Image forms in front of the retina.</td> <td>Image forms behind the retina.</td> </tr> <tr> <td>Focal Length</td> <td>Focal length of eye lens is reduced</td> <td>Focal length of eye lens is increased</td> </tr> <tr> <td>Correction</td> <td>Corrected with a concave lens.</td> <td>Corrected with a convex lens.</td> </tr> </tbody> </table>	Feature	Myopia (Shortsightedness)	Hypermetropia (Longsightedness)	Definition	Inability to see distant objects clearly. Nearby objects can be seen clearly	Inability to see nearby objects clearly. Distant objects can be seen clearly .	Cause	Lengthening of eyeball	Shortening of eyeball	Image Formation	Image forms in front of the retina .	Image forms behind the retina .	Focal Length	Focal length of eye lens is reduced	Focal length of eye lens is increased	Correction	Corrected with a concave lens .	Corrected with a convex lens .	1 1 1 1 1 1
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33)a)ii)	What is power of accommodation of eye? The ability of the eye lens to adjust its focal length to see objects clearly at various distances is called power of accommodation of eye.	2																		
33)b)i)	What is meant by electric current? Electric current (I) is defined as the rate of flow of charges in a conductor . $I = \frac{Q}{t}$ Where Q is the charge and t is the time.	1 1																		
ii)	Name and define its unit. The unit of electric current is the ampere (A) . Definition of 1 Ampere: One ampere is the current that flows when 1 coulomb of charge passes through a conductor in 1 second .	1 1																		
iii)	Which instrument is used to measure the electric current? How should it be connected in a circuit? Ammeter is used to measure electric current. Connection: An ammeter is always connected in series with the circuit so that the current flows through it.	1 2																		
34)a i)	Applications of Avogadro's law: (Any 4 points)																			

	<ul style="list-style-type: none"> It explains Gay-Lussac's law. It helps in the determination of atomicity of gases. Molecular formula of gases can be derived using Avogadro's law It determines the relation between molecular mass and vapour density. It helps to determine gram molar volume of all gases (i.e, 22.4 litre at S.T.P) 	1 1 1 1										
ii)	<p>a) Identify the bond between H and F in HF molecule. Bond: Polar covalent bond</p> <p>b) What property forms the basis of identification? Electronegativity difference (H = 2.1, F = 4.0)</p> <p>c) How does the property vary in periods and in groups? In periods: Electronegativity increases from left to right. In groups: Electronegativity decreases from top to bottom.</p>	1 1 1										
34)b)i)	<p>In what way hygroscopic substances differ from deliquescent substances?</p> <table border="1"> <thead> <tr> <th>Hygroscopic Substances</th> <th>Deliquescent Substances</th> </tr> </thead> <tbody> <tr> <td>Absorb moisture from the air but do not dissolve.</td> <td>Absorb moisture from the air and dissolve in it.</td> </tr> <tr> <td>Do not change their physical state on exposure.</td> <td>Change their physical state (solid to liquid) on exposure.</td> </tr> <tr> <td>Can be amorphous solids or liquids.</td> <td>Typically crystalline solids.</td> </tr> <tr> <td>Silica gel, concentrated sulphuric acid.</td> <td>Sodium hydroxide (NaOH), Calcium chloride (CaCl₂).</td> </tr> </tbody> </table>	Hygroscopic Substances	Deliquescent Substances	Absorb moisture from the air but do not dissolve.	Absorb moisture from the air and dissolve in it.	Do not change their physical state on exposure.	Change their physical state (solid to liquid) on exposure.	Can be amorphous solids or liquids.	Typically crystalline solids.	Silica gel, concentrated sulphuric acid.	Sodium hydroxide (NaOH), Calcium chloride (CaCl ₂).	1 1 1 1
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Silica gel, concentrated sulphuric acid.	Sodium hydroxide (NaOH), Calcium chloride (CaCl ₂).											
ii)	<p>What is aqueous and non-aqueous solution? Give an example.</p> <ul style="list-style-type: none"> Aqueous solution: A solution in which water is the solvent (e.g., salt in water). Non-aqueous solution: A solution in which the solvent is a liquid other than water (e.g., sulphur in carbon disulphide) 	1.5 1.5										
35)a)	<p>Why are leucocytes classified as granulocytes and agranulocytes? Name each cell and mention its functions.</p> <p>Leucocytes are classified into granulocytes and agranulocytes based on the presence or absence of granules in their cytoplasm.</p> <p>Granulocytes: These have granules in their cytoplasm and a lobed or irregular nucleus. They include:</p> <ul style="list-style-type: none"> Neutrophils: Make up 60%–65% of leucocytes. Their number increases during infection and inflammation. They are involved in fighting infections. Eosinophils: Make up 2%–3% of leucocytes. Their number increases during allergies and parasitic infections. They help detoxify toxins. Basophils: Make up 0.5%–1% of leucocytes. They release chemicals during inflammation. <p>Agranulocytes: These do not contain granules in their cytoplasm and include:</p> <ul style="list-style-type: none"> Lymphocytes: Make up 20%–25% of leucocytes. They produce antibodies during bacterial and viral infections. Monocytes: Make up 5%–6% of leucocytes. They are the largest leucocytes, amoeboid in shape, phagocytic, and can engulf bacteria. 	1 3 3										
35)b)i)	<p>Write the events involved in the sexual reproduction of a flowering plant:</p> <p>a) Discuss the first event and write the types : The events involved are Pollination and Fertilisation Pollination: Transfer of pollen from anther to stigma (self or cross-pollination). Types: Self-pollination and cross-pollination.</p> <p>b) Mention the advantages and disadvantages of the event</p> <ul style="list-style-type: none"> Advantages: Ensures reproduction even in isolated plants. Disadvantages: Reduces genetic diversity. 	1 1 1 2										
35)b)ii)	<p>Why is vegetative propagation practiced for growing some types of plants?</p> <p>It allows plants to reproduce faster, maintain genetic uniformity, and grow plants that do not produce viable seeds.</p>	2										