SHRI VIDHYABHARATHI MAT. HR.SEC.SCHOOL



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PUBLIC EXAMINATION - APRIL - 2025 SSLC - SCIENCE – TENTATIVE ANSWER KEY

MARKS: 75

S.NO	ANSWER	MARK
	PART-I	
1.	c) 98x10 ⁴ dyne	1
2.	d) bifocal lens	1
3.	b) 10V	1
4.	b) Irene curie	1
5.	b) Hg	1
6.	b) increases	1
7.	c) 1x10 ⁻¹¹ M	1
8.	b) combustion of ethanol	1
9.	d) endodermis	1
10.	b) Metacentric	1
11.	d) December 1	1
12.	d) Scratch	1
	PART-II	
13.	One calorie:	
14.	 Longitudinal wave: It is a wave in which the particles of the medium vibrating along the direction of propagation of the wave. 	2
 15.	The TWO conditions necessary for rusting of iron are.	
13.	 Presence of oxygen Presence of water droplets in the atmosphere. Iron is exposed to moist air 	1 1
16.	Match it:	
	 Functional Group –OH Heterocyclic Compounds Unsaturated Componds Soap Carbocyclic Compounds Alcohol Furan Ethene Potassium Stearate Benzene 	2
17.	Importance of valves in the heart:	
	The valves are muscular flaps that regulate the flow of blood in a single direction. They prevent back flow of blood.	2

18.	Bolting:	
	 Treatment of rosette plants with gibberellin induces sudden shoot elongation 	2
	followed by flowering. This is called bolting	
	It is induced by artificial treatment with plant hormone gibberllin.	
19.		
	A Exine	
	The state of the s	
	B Intine	2
	Vegetative nucleus D	
	C Generative cell	
	Generative cen	
20.	The degenerated wing of a kiwi is an acquired character:	
20.	❖ According to Lamarck's use and disuse theory the degenerated wing of a kiwi is an	2
	example for organ of disuse.	_
	 Because when an organ is not used for long time it gradually degenerates 	
	because when an organ is not used for long time it gradually degenerates	
21.	If trees are cut down:	
	Cutting down of trees gives rise to ecological problems like floods, drought, soil	
	erosion, loss of wild life, extinction of species, imbalance of biogeochemical cycles,	2
	alteration of climatic conditions and desertification.	
22.	Molecular mass of $CH_4 = 12 + 4$	
	= 16 g	
	Mass % of carbon = $\frac{12}{16}$ X 100	
	= 75 %	1
	Mass % of hydrogen = $\frac{4}{16}$ X 100	
	16 16 16 16 16 16 16 16 16 16 16 16 16 1	
	25.0/	
	= 25 %	1
22	PART-III	1
23.	PART-III The ideal gas equation:	1
23.	PART-III The ideal gas equation: The ideal gas equation is an equation, which relates all the properties of an	1
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The above relation is called the combined law of gases. If you consider a gas, which contains μ moles of the gas, the number of atoms contained will be equal to μ times the Avogadro number, N_A .

i. e.
$$n = \mu N_A$$
......(5)

Using equation (5), equation (4) can be written as

$$PV/\mu N_A T = constant$$

The value of the constant in the above equation is taken to be k_B , which is called as Boltzmann constant (1.38 × 10⁻²³ JK⁻¹).Hence, we have the following equation:

$$PV/\mu N_A T = k_B$$

$$PV = \mu N_A k_B T$$

Here, $\mu N_A k_B = R$,

which is termed as universal gas constant whose value is 8.31 J mol⁻¹ K⁻¹.

PV = RT.

Ideal gas equation is also called as equation of state because it gives the relation between the state variables and it is used to describe the state of any gas.

24.	Myopia	Hypermeteropia	
I ⊨	Myopia, also known as short sightedness.	Hypermeteropia, also known as long sightedness.	1/2
	It occurs due to the lengthening of eye ball.	It occurs due to the shortening of eye ball.	1/2
	With this defect, nearby objects can be seen clearly	Distant objects can be seen clearly.	1/2
	Distant objects cannot be seen clearly.	Nearby objects cannot be seen clearly	1/2
	The focal length of eye lens is reduced or the distance between eye lens and retina increases .	The focal length of eye lens is increased or the distance between eye lens and retina decreases.	1/2
	In far point will not be i nfinity for such eyes and far point has come closer .	The near point will not be at 25cm for such eyes and the near point has moved farther.	1/2
	Due to this, the image of distant objects are formed before the retina	Due to this, the image of nearby objects are formed behind the retina	1/2
	This defect can be corrected using a concave lens . The focal length of the concave lens to be used	This defect can be corrected using a convex lens . The focal length of the convex lens to be used is computed	1/2

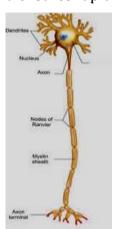
25. <u>The properties of alpha, beta and gamma radiations:</u>

Properties	αrays	βrays	γrays
What are	Helium nucleus	They are electrons	They are
they?	(2He ⁴) consisting of	(-1 e 0), basic elementary	electromagnetic
	two protons and	particle in all atoms.	waves consisting
	two neutrons.		of photons.
Charge	Positively charged	Negatively charged	Neutral particles.
	particles.	particles.	Charge of each
	Charge of each	Charge of each beta	gamma particle =
	alpha particle = +2e	particle = -e	zero

	Ionising	100 time greater	Comparatively low	Very less	
	power	than β rays and		ionization power	
		10,000 times			
	Penetrating	greater than γ rays Low penetrating	Penetrating power is	They have a very	
	power	power (even	greater than that of α	high penetrating	
	power	stopped by a thick	rays. They can	power greater than	
		paper)	penetrate through a	that of β rays. They	
			thin metal foil.	can penetrate	
				through thick metal	
				blocks.	
	Effect of	Deflected by both	Deflected by both the	They are not	
	electric and	the fields. (in accordance with	fields; but the direction of deflection is	deflected by both the fields.	
	magnetic field	Fleming's left hand	opposite to that for	the fields.	
		rule)	alpha rays. (in		
			accordance with		
			Fleming's left hand		
			rule)		
	Speed	Their speed ranges	Their speed can go up	They travel with	
		from 1/10 to 1/20	to 9/10 times the speed	the speed of light.	
		times the speed of light.	of light.		
26.	The application	s of Avogadro's law:			
		ıy-Lussac's law.			
	-	e determination of ator	nicity of gases.		
	Molecular for	mula of gases can be d	lerived using Avogadro's la	W	4
			molecular mass and vapou	•	
0.7		termine gram molar vo	olume of all gases (i.e, 22.4	litre at S.T.P)	
27.	i) Alloy: An alloy is	a homogeneous mixtu	re of two or more metals o	r of one or more	2
	_	ain non-metallic eleme		r or one or more	
	ii) Deserted				
	ii) Reasons for a	illoying: modify appearance ar	nd colour		
		modify chemical activ			
		lower the melting poi			2
		increase hardness and increase resistance to	_		
28.		of cleansing action of			
	•		chemically distinct (hydro	ophilic &	
		phobic) parts that inter	act differently with water.		
	Hydrophilic:	mo molor and 1991 :	o a shout bead with a self-	overlote average	1
		-	s a short head with a carbo end having the long tail ma		
		g and one non-polar e carbon chain.	nu naving the long tall lile	aut VI IIIT	
	_		(Water loving) in nature	and this end is	
	attracted towards water.				

Hydrophobic: 1 ❖ The non-polar end is **hydrophobic (Water hating)** in nature and it is attracted towards dirt or oil on the cloth, but not attracted towards water. Thus, the hydrophobic part of the soap molecule traps the dirt and the hydrophilic part makes the entire molecule soluble in water. **Mechanism:** ❖ When a soap or detergent is dissolved in water, the molecules join together 2 as clusters called 'micelles'. ❖ Their long hydrocarbon chains attach themselves to the oil and dirt. ❖ The dirt is thus surrounded by the non-polar end of the soap molecules. ❖ The charged carboxylate end of the soap molecules makes the micelles soluble in water. Thus, the dirt is washed away with the soap. 29. Locomotion in leech takes place by (i) looping or crawling movement (ii) Swimming movement. (i) Looping or Crawling movement 2 This type of movement is brought about by the contraction and relaxation of muscles. The two suckers serve for attachment during movement on a substratum. 2 (ii) Swimming movement Leeches swim very actively and perform undulating movements in water. 30. **Explain the structure of neuron:** A neuron typically consists of three basic parts: Cyton, Dendrites and Axon. (i) Cyton: Cyton is also called cell body or perikaryon. ❖ It has a central nucleus with abundant cytoplasm called neuroplasm. 1 ❖ The cytoplasm has large granular body called Nissl's granules and the other cell organelles like mitochondria, ribosomes, lysosomes, and endoplasmic recticulum. Neurons do not have the ability to divide. Several neurofibrils are present in the cytoplasm that help in transmission of nerve impulses to and from the cell body. (ii) Dendrites: ❖ These are the numerous branched cytoplasmic processes that project from the surface of the cell body. 1 ❖ They conduct nerve impulses towards the cyton. The branched projections increase the surface area for receiving the signals from other nerve cells. (iii) Axon: ❖ The axon is a single, elongated, slender projection. ❖ The end of axon terminates as knob like swellings called synaptic knob 1 ❖ Axolemma:The plasma membrane of axon ❖ Axoplasm: The cytoplasm of axon ❖ It carries impulses away from the cyton Myelin sheath:

- ❖ The protective sheath of axon
- ❖ It is covered by a layer of Schwann cells called neurilemma
- ❖ It breaks at intervals by depressions called nodes of ranvier.
- It acts an insulator and ensures rapid transmission of nerves impulses



1

31. **Soil erosion causes: (any-4)**

- The top layers of soil contain humus and mineral salts, which are vital for the growth of plants.
- * Removal of upper layer of soil by wind and water is called soil erosion.
- Soil erosion causes a significant loss of humus, nutrients and decrease the fertility of soil.
- ❖ The direct and primary effect of soil erosion is soil loss and nutrient leaching resulting in reduction of land productivity.
- ❖ Annual floods cause damages to crops property and lives.
- ❖ Deforested rain forest soil becomes dry and nutrient- deficient as there is no longer vegetation to hold water and nutrient in place
- Desertification is another possible consequence of erosion.
- Signification loss of humus and nutrients
- It decreases the fertility of the soil
- Vegetation, cover cannot be retained
- This will affect ground water levels
- Heavy rains further erode soil and saturate waterways with excess nutrients disrupting the food chains of tropical ecosystems.
- ❖ Eroded sediments can even change the course of rivers which suffer from huge deposits of silt from deforestation.

ii)Prevent soil erosion: (any-2)

- Retain vegetation cover, so that soil is not exposed.
- Cattle grazing should be controlled.
- Crop rotation and soil management improve soil organic matter.
- * Runoff water should be stored in the catchment.
- Reforestation, terracing and contour ploughing.
- ❖ Wind speed can be controlled by planting trees in form of a shelter belt.

2

2

32.	$n' = \left(\begin{array}{c} v \\ v - v_s \end{array}\right) n$	1
	$= \left(\frac{V}{V - \left(\frac{1}{10}\right)_{V}}\right) n = \left(\frac{10}{9}\right) n$	2
	$= \left(\frac{10}{9}\right) \times 90 = 100 \mathrm{Hz}$	1
	PART-III	
33. a)	i) State and prove the law of conservation of linear momentum:	
	* "There is no change in the linear momentum of a system of bodies as long as no net external force acts on them.	1
	u_1 u_2 F_A F_B v_1 v_2	
	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$	
	 Proof: ♣ Let two bodies A and B having masses m₁ and m₂ move with initial velocity u₁ and u₂ in a straight line. ♣ Let the velocity of the first body be higher than that of the second body. i.e., u₁>u₂. ♣ During an interval of time t second, they tend to have a collision. ♣ After the impact, both of them move along the same straight line with a velocity v₁ and v₂ respectively. Force on body B due to A, FA= m₂ (v₂-u₂)/t Force on body A due to B, FB = m₁ (v₁-u₁)/t By Newton's III law of motion, 	2
	Action force = Reaction force	
	$F_{B} = -F_{A}$	
	$m_1 (v_1-u_1)/t = -m_2 (v_2-u_2)/t$	
	$m_1v_1 + m_2v_2 = m_1u_1 + m_2u_2$	
	The above equation confirms in the absence of an external force, the algebraic sum of the momentum after collision is numerically equal to the algebraic sum of the momentum before collision. Hence the law of conservation linear momentum is proved.	1
	ii) Principle of moments: Principle of moments states that When a number of like or unlike parallel forces act on a rigid body and the body is in equilibrium, then the algebraic sum of the moments in the clockwise direction is equal to the algebraic sum of the moments in the anticlockwise direction. Moment in clockwise direction = Moment in anticlockwise direction $F_1 \times d_1 = F_2 \times d_2$	2

		(OR)	1		
	i) Electric current:	(OII)			
		as 'current' and it is represented by the	1		
	symbol 'I'. It is defined as the rate of flow of charges in a conductor. Q				
	$I = \frac{Q}{t}$ ii) Name and define its unit: > SI Unit of electric current is ampere.				
		conductor is said to be one ampere, when a			
		across any cross-section of a conductor, in one	1		
	second.				
	• 1 amper	$e = \frac{1 \ coulomb}{1 \ second}$			
		13000.10	1		
	iii) <u>Instrument:</u> Ammeter.		1		
	It is used to measure electric current. It should be connected in series in a		_		
		Circuit			
34. a)	<u>i)</u>				
	Hygroscopic substances	Deliquescence substances			
	When exposed to the atmosphere at	When exposed to the atmospheric air			
	ordinary temperature, they absorb	at ordinary temperature, they absorb			
	moisture and do not dissolve.	moisture and dissolve.			
	Hygroscopic substances do not	Deliquescent substances change its			
	change its physical state on exposure	physical state on exposure to air.			
	to air.				
	Hygroscopic substances may be	Deliquescent substances are	3		
	amorphous solids or liquids.	crystalline solids.			
	They may be used as drying agents .	They dissolve in water forming			
		saturated solutions.			
	E.g: quick lime , silica gel	E.g: Caustic soda , caustic potash			
	ii) Aquatic animals live more in cold r		2		
	 More amount of dissolved oxygen is present in the water of cold regions. The solubility of oxygen in water is more at low temperatures. 				
	iii) <u>Volume percentage:</u>	•			
	The percentage by volume of solute (in ml) present in the given volume of the				
	solution.	and (in mi) present in the given volume of the	1		
		noluma of the solute			
1.3	Volume percentage :	$= \frac{volume \ of \ the \ solute}{volume \ of \ the \ solution} \times 100$	1		
b)					
	Volume nergentage	=volume of the solute×100			
	votume percentage	$= \frac{\text{volume of the solute}}{\text{volume of the solute + volume of the solvent}} \times 100$			
	(OR)				

REVERSIBLE REACTION			IRREVERSIBLE REACTION	
It can be reversed under suitable condition.		suitable	It cannot be reversed.	
Both for	ward and backw	ard reactions	It is u nidirectional . It proceeds only in	
take plac	ce simultaneously		forward direction.	
It attains	s equilibrium		Equilibrium is not attained.	
The reactants cannot be converte d completely into products It is relatively slow .		converte d	The reactants can be completely conver into products	
			It is fast	
ii)	CaCO (A) calcium carbo CO _{2 (§}	nate calcium $G_{g)}^{(B)}$ $G_{g)} + H_2O_{(g)} \rightarrow H_2CO_{(g)}$	oxide Carbon di oxide	
		(C) (Carl	bonic Acid)	
	Compound	Molecular forn		
	A	CaCO ₃	calcium carbonate	
	В	CaO	calcium oxide	
	C	CO_2	carbon di oxide	

S. N	Tissues	Monocot Root	Dicot Root
1	Number of Xylem	Polyarch	Tetrarch
2	Cambium	Absent	Present
			(During secondary growth only)
3	Secondary Growth	Absent	Present
4	Pith	Present	Absent
5.	conjunctive tissue	Made up of sclerenchyma	Made up of parenchyma
6.	Eg	Maize	Bean

ii) Aerobic and Anaerobic respiration

Aerobic respiration

- ❖ Aerobic respiration is a type of cellular respiration
- ❖ In which organic food is completely oxidized with the help of oxygen into carbon dioxide, water and energy. It occurs in most plants and animals.
- Lot of energy is produced
- **♦** $C_6H_{12}O_6 + 6O_2 \rightarrow 6CO_2 + 6H_2O + ATP$

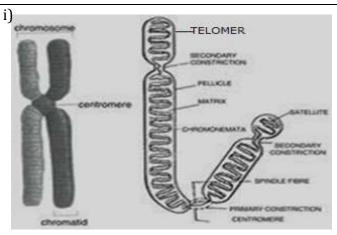
Anaerobic respiration

- ❖ Anaerobic respiration takes place without oxygen.
- Glucose is converted into ethanol (Ethanol fermentation by yeast) or lactic acid (lactic acid fermentation by bacteria).
- ❖ Very small quantity of energy is produced $C_6H_{12}O_6 \rightarrow 2CO_2 + 2C_2H_5OH + Energy (ATP)$

4

3

(OR)



- ❖ The chromosomes are thin, long and thread like structures consisting of two identical strands called sister chromatids. They are held together by the centromere.
- Each chromatid is made up of spirally coiled thin structure called chromonema.
- The chromonema has number of bead-like structures along its length which are called **chromomeres**.
- ❖ The chromosomes are made up of DNA,RNA, chromosomal proteins (histones and non-histones) and certain metallic ions.
- These proteins provide structural support to the chromosome.

A chromosome consists of the following regions:

<u>Primary constriction</u>: The two arms of a chromosome meet at a point called **primary constriction** or **centromere**.

❖ The centromere is the region where spindle fibres attach to the chromosomes during cell division.

Secondary constriction:

❖ Some chromosomes possess secondary constriction **at any point** of the chromosome. They are known as the nuclear zone or **nucleolar organizer** (formation of nucleolus in the nucleus).

Telomere:

- ❖ The **end of the chromosome** is called telomere.
- ❖ Each extremity of the chromosome has a polarity and prevents it from joining the adjacent chromosome.
- ❖ It maintains and provides **stability to the chromosomes**.

Satellite:

- Some of the chromosomes have an elongated **knob-like appendage** at one end of the chromosome known as satellite.
- The chromosomes with satellites are called as the **sat-chromosomes**.

ii)

11)		
S.n	Somatic gene therapy	Germ line gene therapy
1.	It is the replacement of defective	It is the replacement of defective gene in
	gene in somatic cell	germ cell (egg and sperm)
2.	It is only beneficial to the patient	The gene can be carried to the next
	but not corrected gene may not be	generation but till date targeted only
	carried to the next generation	somatic cell gene therapy has been
		targeted
3.	It is take place in body cell	It is take place in egg and sperm cell

2

3

2

ANALYSIS

	B00K 1	BOOK BACK		INSIDE
PART	NUMBER OF QUESTIONS	MARKS	NUMBER OF QUESTIONS	MARKS
PART-I	10	10	2	2
PART-II	9	18	1	2
PART-III	7	28	3	12
PART-IV	6	42	-	-

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