DIRECTORATE OF GOVERNMENT EXAMINATIONS
S.S.L.C. PUBLIC EXAM- APRIL 2024
SCIENCE
ANSWER KEY
Part – I

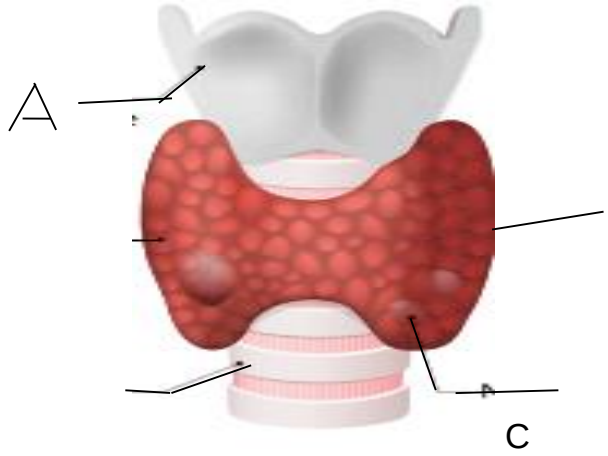
Answer all the Questions: **12 x 1 = 12**

1.	(b)	Stem	**1**
2.	(c)	Fatty matter	**1**
3.	(d)	8.31 J Mol^{-1} K^{-1}	**1**
4.	(c)	Electrical Energy	**1**
5.	(b)	Restriction endonucleus	**1**
6.	(a)	$6.023x10^{23}$	**1**
7.	(b)	Pituitary Gland	**1**
8.	(c)	The flowers are brightly coloured have smell and nectar	**1**
9.	(c)	Mass of the object	**1**
10.	(c)	Atrium → Ventricle → Arteries → Vein	**1**
11.	(c)	$2CO_2 + O_{2(g)} \rightarrow 2CO_{2\,(g)}$	**1**
12.	(c)	Carcinoma	**1**

Part – II

Answer **any Six** questions. Question No.**24** is **compulsory.** **7 x 2 = 14**

13	**Coefficient of apparent expansion:** Coefficient of apparent expansion is defined as the ratio of the apparent rise in the volume of the liquid per degree rise in temperature to it unit volume It's SI unit is K^{-1}	1 1/2 1/2
14	❖ Tungsten has a very high melting point. ❖ If it is used in fuse wire, it will not melt when large current passes through it ❖ The appliances will get damaged	2
15	**Rust :** ❖ Rust is brown coloured hydrated ferric oxide. ❖ $4Fe + 3O_2 + X.H_2O \rightarrow 2Fe_2O_3.XH_2O$	2
16	**Stage :** ❖ Stage is the background appearing when we open the scratch window. ❖ The background will most often be white. ❖ We can change the background colour as we like	2
17	❖ SA node acts as the pacemaker of the heart. ❖ It is capable of initiating impulse which can stimulate the heart muscles to contract	1 1
18	**Parts of hind brain**: ❖ Cerebellum ❖ Pons ❖ Medulla Oblangata	2

19	 A – Thyroid Cartilage B – Thyroid gland C – Nodule D - Trachea	1/2 1/2 1/2 1/2
20	❖ The milk produced from the breast during the first 2 to 3 days after child birth is called colostrums. ❖ Milk production is stimulated by prolactin hormone ❖ The ejection of milk is stimulated by oxytocin hormone	2
21	**Metastasis**: ❖ The cancerous cells migrate to parts of the body and affect new tissues. ❖ This process is called metastasis	2
22	Given: $P^H = 4.5$ $P^{OH} = ?$ Solution : $P^H + P^{OH} = 14$ $P^{OH} = 14 - 4.5$ $P^{OH} = 9.5$	1 1

Part - III

Answer **any Seven** questions. Question No.**32** is **compulsory.** **7x 4 = 28**

23 **1**

Types of Inertia :

- ❖ Inertia of rest
- ❖ Inertia of motion
- ❖ Inertia of direction

a) Inertia of rest :

- ❖ To resist a body to change its state of rest.
  Ex: After shaking leaves fall down.

b) Inertia of motion :

- ❖ To resist a body to change its state of motion.
  Ex: An athlete runs some distance before jumping.

c) Inertia of direction :

- ❖ To resist a body to change its direction.
  Ex : A sharp turn while driving a car you tend to lean side way.

24

a)

Natural Radioactivity	Artificial Radioactivity
❖ It cannot be controlled	❖ It can be controlled
❖ Spontaneous process	❖ Induced process
❖ Alpha, Beta and gamma radiations are emitted	❖ Neutron,Positrons are emitted

1 **1** **1**

b) Electric Heater, Electric Iron (Iron Box) **1**

25

a) When magnesium sulphate heptahydrate crystals are gently heated, it loses seven water molecules, and becomes anhydrous magnesium sulphate **2**

$$MgSO_4 . 7H_2O \underset{\text{Cooling}}{\overset{\text{Heating}}{\rightleftharpoons}} MgSO_4 + 7H_2O$$

(Magnesium Sulphate heptahydrate) (Anhydrous Magnesium sulphate)

b) Solubility is defined as the number of grams of a solute that can be dissolved in 100 g of a solvent to form its saturated solution at a given temperature and pressure **2**

26	a) RQ = Volume of CO_2 liberated / Volume of O_2 consumed b) ❖ During light independent reaction, CO_2 is reduced into carbohydrates with the help of ATP and $NADPH_2$ ❖ So light dependent reaction occur before the light independent reaction.	**2** **2**
27	**Dental formula of rabbit** : I = 2/1 C = 0/0 PM = 3/2 M = 3/3	**1** **1** **1** **1**
28	a) ❖ Euploid considered to be advantageous to both plants and animals, as they often result in increase fruit and flower size. b) i) Unipolar neuron: ❖ Only one nerve process arises from the cyton. ii) Bipolar neuron: ❖ Cyton gives rise to two nerve processes iii) Multipolar neuron : ❖ The cyton gives rise to many dendrons and an axon found in cerebral cortex of brain.	**2** **2**

29 (Any 4 points) — **4**

Artery	Vein
❖ Distributing vessels	❖ Collecting vessel
❖ Deep location	❖ Superficial in location
❖ Blood flow with high pressure	❖ Blood flow with low pressure
❖ Wall of artery is strong thick and elastic	❖ Wall of vein is weak thin and non-elastic
❖ All arteries carry oxygenated blood except pulmonary arteries	❖ All veins carry deoxygenated blood except pulmonary veins

30 — **2**

Ethnobotany:

Ethnobotany is the study of regions plants and their practical uses through the traditional knowledge of the local culture of people.

Importance :

- ❖ It provides traditional uses of plant.
- ❖ It gives information about certain unknown and known useful plants.

31

a) **Consequences of deforestation** : (Any 4 points) — **2**

- ❖ Flood
- ❖ Drought
- ❖ Soil erosion
- ❖ Loss of wild life
- ❖ Extinction of species
- ❖ Imbalance of biogeochemical cycles
- ❖ Alteration of climate condition.
- ❖ Desertification

b) Applications of DNA finger printing technique: (Any 2 points) — **2**

- ❖ DNA finger printing technique is widely used in forensic applications like crime investigation such as identifying the culprit
- ❖ It is used in paternity testing incase of disputes.
- ❖ It helps in the study of genetic diversity of population, evolution and speciation.

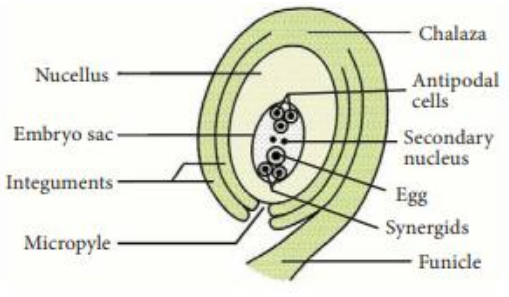
32	a) 1. The acid that renders aluminium passive is dilute or concentrated nitric acid. 2. Aluminium becomes passive due to the formation of an oxide film on its surface. b) Number of moles = $\frac{\text{Number of molecules of } NH_4Cl}{\text{Avagadro Number}}$ $= \frac{1.51 \times 10^{23}}{6.023 \times 10^{23}}$ = 1 / 4 = 0.25 moles of NH_4Cl	**1** **1** **1**

Part - IV

Answer all the question: **3 x 7 = 21**

33	a) (Any 2 points) i) ❖ Convex lens is used in camera lenses and magnifying lenses. ❖ Used in making microscope, telescope and slide projectors. ❖ Used to correct the object of vision called hyper metropia. ii) ❖ When a beam of white light or composite light is refracted through any transparent media such as glass or water, it splits into its component colours. ❖ This phenomenon is called as dispersion of light. iii) ❖ As the red light has highest wavelength among all the colours, it is scattered least. ❖ It travels a longer distance in the atmosphere. iv) Least count of travelling microscope : 0.01 mm	**2** **2** **1**
	b) i) Echo: An Echo is the sound reproduced due to the reflection of the original sound from various rigid surfaces.	**1**

	ii) ❖ Minimum time gap between the original sound and an echo must be 0.1 s. ❖ Minimum distance required to hear an echo is 17.2 m. iii) ❖ Used in obstetric ultrasonography ❖ Safe testing tool. iv) Speed of sound = Distance travelled / Time taken = 2d / t	1 1 1 1 2
34 **(a)**	i) Number of Moles of O_2 = Volume of S.T.P / Molar Volume = 3 / 22.4 = 0.1339 moles Number of Molecules = Number of moles x Avagadro number = 0.1339 x 6.023 x 10^{23} = 0.8064 x 10^{23} = 8.064 x 10^{22} O_2 molecules Number of moles of Cl_2 = 5 / 22.4 = 0.2232 moles Number of molecules = 0.2232 x 6.023 x 10^{23} = 1.344 x 1023 molecules Number of moles of H_2= 6 / 22.4 = 0.2678 moles Number of molecules = 0.2678 x 6.023 x 10^{23} = 1.6129 x 10^{23} molecules 1) 6 litre of H_2 has the highest number of molecules 2) 3 litre of O_2 has the lowest number of molecules	
	ii) ❖ An atom is no longer indivisible. ❖ Atoms of the same element may have different atomic mass. ❖ Atoms of different element can be transmitted into atoms of other elements ❖ Atom is no longer indestructive. ❖ Atoms may not always combine in a simple whole number	5

	ratio. ❖ Atom is the smallest particle that takes part in a chemical reaction. ❖ The mass of an atom can be converted into energy ($E=mc^2$)	
34 **(b)**	i) ❖ Some detergents having a branched hydro carbons chain are not fully biodegradable by micro-organisms present in water. ❖ So they cause water pollution. ii) ❖ A → Ethanoic acid CH_3COOH ❖ $C_2H_5OH + CH_3COOH \rightarrow CH_3COOC_2H_5 + H_2O$ ❖ Esterification	**2** **2** **2** **1**
35 **a)**	i) Synthetic auxin : ❖ Artifically synthesized auxin that have properties like auxins are called synthetic auxins. Eg : 2-4-D ii) Structure of Ovule: ❖ Nucleus is enclosed by two integuments leaving an opening called as micropyle. ❖ The ovule is attached to ovary wall by a stalk known as funiculus. ❖ Chalaza is the basal part ❖ The embryo sac contains seven cells and the eighth nuclei located within the nucleus ❖ Three cells at the micropylar end form the egg apparatus. ❖ 'The three cells at the chalaza end are the antipodal cells.  	**1** **1** **3** **2**

35 b)

i) Father of Indian Green Revolution:

Dr.M.S.Swaminathan — **1**

ii)

Out breading	Inbreading	
❖ Cross between two different species with desirable features of economic value are mated.	Mating of closely related animals within the same breed for about 4-6 generation	**1**
❖ The hybrids are stronger and vigorous than their parents	It helps in the accumulation of superior genes and eliminate undesirable genes.	**1**
❖ Eg: Mute	Eg : Sheep Hissardale	

35 (b)

Factors	Type -1	Type – 2
Prevalence	10-20 %	80-90%
Age of onset	Juvenile onset (< 20 years)	Maturity onset (> 30 years)
Body weight	Normal (or) under weight	Obese
Defect	Insulin deficiency due to destruction of β cells	Target cells do respond to insulin
Treatment	Insulin administration in necessary	Can be controlled by diet, exercise and medicine

4
