DIRECTORATE OF GOVERNMENT EXAMINATIONS, CHENNAI – 6
SSLC EXAMINATIONS, MARCH – 2017
KEY ANSWER FOR SCIENCE

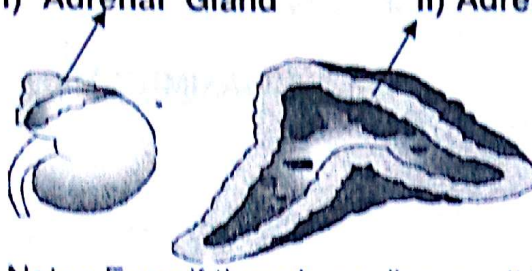**MAXIMUM MARKS : 75**

SECTION – I
(Marks : 15)

Choose the Correct Answer		15 X 1 = 15
1	Beta	1
2	BCG	1
3	Thymus	1
4	Micropyle	1
5	Left auricle and left ventricle	1
6	Mycorrhizal root	1
7	Primary treatment	1
8	Helium-oxygen	1
9	Lactic acid	1
10	14th group	1
11	Ethanoic acid	1
12	0.01 mm	1
13	Force	1
14	Electric energy	1
15	Magnetic field	1

SECTION – II
(Marks : 40)
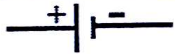
Note : Answer any twenty Questions :		20 X 2=40	
16	(i) Intra specific	1	2
	ii) Inter generic	1	
17	Genetic engineering is the modification of the genetic information of living organisms by manipulation of DNA i.e. by adding, removing or repairing part of genetic material (DNA) and changing the phenotype of the organism.		2
18	i) Vaccine - microbes	4X½	2
	ii) Natural gas - fuel		
	iii) Citric acid – organic acids		
	iv) Vitamins - metabolism		
19	**Not correct**	1	2
	In marasmus the child loses weight and suffers severe diarrhoea and it will appear as though bones are covered by skin.		
	In Kwashiorkar, the child develops an enlarged belly with swelling in the face and feet.	1	

SC (e)—1

20	I) Adrenal Gland II) Adrenal cortex	Diagram ½+ ½ Parts ½+ ½	2
	Note : Even if there is no diagram (½ + ½ = 1 Mark) can be given to the parts.		
21	I) Exine ii) Tube Nucleus	Diagram 1 Parts ½+ ½	2
22	1) Doubly thick skin 2) Water storing osmotic cells 3) Thick bushy eye brows 4) Nostrils which can be closed during desert storms.	4X½	2
23	i) Glomerulus ii) Seal	1 1	2

24	Excretory organ	Disposed as	Excretory products		2
	Kidneys	Urine	Nitrogenous waste products – urea, uric acid, creatinine etc		
	Lungs	Exhaled/Expired air	**Carbon-di-oxide / Co2 and water vapour**	1	
	Skin	**Sweat**	Excess water and salts	1	

25	i) A – Geotropism B - Phototropism	½ ½	2
	ii) Any one difference		

		Movement of A and B	Moment of mimosa	
	1	Movement is dependent on growth	Movement is independent on growth	1
	2	The plants respond to stimuli slowly	Immediate response to stimuli	

26	i) Fermentation (or) anaerobic respiration ii) Yeast	1 1	2
27	(A) (B) a) Ammonotelic - fish b) Ureotelic - mammal c) Uricotelic - birds d) Nephridia - annelids	4x½	2

28	Grass → Grasshopper → Frog → Snake → Eagle		2
29	**Any 4 Biofuels** 1) Bioalcohol 2) Green diesel 3) Bio diesel 4) Vegetable oil 5) Bioethers 6) Biogas	4X½	2

30						

Sources	A	B	C	4X½	2
Renewable	**Hydrogen**	Wind	**Solar energy**		
Non-Renewable	**Coal**	Natural gas	**Petroleum**		

31	1) Coal 2) Petroleum 3) Natural Gas (Any Two)	1 1	2
32	**Brownian movement :** - The phenomenon by which the colloidal particles are in continuous random motion is called Brownian movement.		2
33	Weight percent $= \dfrac{\text{weight of the solute}}{\text{weight of the solute}+\text{weight of solvent}} \times 100$ $\qquad = \dfrac{20}{20+50} \times 100$ $\qquad = 28.57\%$	1 ½ ½	2
34	Number of moles $=\dfrac{\text{No.of atoms}}{6.023 \times 10^{23}}$ (OR) $\dfrac{\text{No.of atoms}}{\text{Avogadro Number}}$ $\qquad = \dfrac{12.046 \times 10^{22}}{6.023 \times 10^{23}}$ $\qquad = \mathbf{0.2\ mole}$ (Result + Unit)	1 ½ ½	2

35	i) Weak acid – A, Strong acid - B
	ii) **Weak acids** –CH_3COOH (Acetic Acid), HCOOH (Formic Acid)
	   Citric Acid, Malic Acid, Tartaric Acid
	                    (any one Weak acid.)
	Strong acids - HCl (Hydro Chloric Acid) , HNO_3(Nitric Acid),
	   H_2SO_4 (Sulphuric Acid), H_3PO_4 (Phospharic acid)
	                    (any one strong acid)
		½+½
		
		½
		
		½
			2

36	i) HCOOH ii) Vinegar	1 1	2
37	i) **First period** is a shortest period. It contains only **two elements (or) Second period** is a short period. It contains **eight elements.** ii) Group 18 elements are called **noble gases or inert gases (or)** Group 17 elements are called **halogen family**	1 1	2
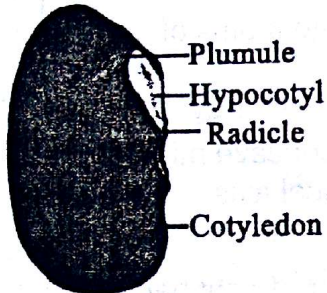
			2
38	a) Assertion and reason are correct and relevant to each other		2
39	i) A – CH_3COOH / (Ethanoic acid) / Acetic Acid (Formula or Name) B – $CH_3COOC_2H_5$ / (Ethyl ethanoate) / Ethyl Acetate	½ ½	2
	ii) Esterification : $$C_2H_5OH + CH_3COOH \xrightarrow{\text{Conc. } H_2SO_4} CH_3COOC_2H_5 + H_2O$$	½ ½	
40	d) **(A)** is correct and **(R)** supports **(A)**		2
41	m = 1Kg , h = 20m velocity with which the object hits the ground $V_1 = \sqrt{2gh}$ $= \sqrt{2 \times 10 \times 20} = \sqrt{400} = 20 \text{ ms}^{-1}$ velocity with which the object rebounds $V_2 = -20 \text{ ms}^{-1}$ Change in momentum = final momentum – initial momentum (or) $= mv_2 - mv_1$ $= [1 \times (-20)] - [1 \times 20]$ $= -20 - 20$ $= -40 \text{ Kgms}^{-1}$ Magnitude of change in momentum is 40 Kgms^{-1}	½ ½ ½ ½	2

42		COMPONENTS	SYMBOLS	4 X ½	2
	1	An electric cell	$\dashv\vdash$ (+ −)		
	2	Plug Key (or) Switch (Closed)	—(•)—		
	3	A Wire Joint	—•—		
	4	A Resistor of resistance R	—ⱮⱮⱮ—		

43.	i) Ammeter ii) Non-Conventional source of energy	1 1	2
44	**Any two points** 1) The difference in temperature between the water at the surface of the sea and in deeper section is obtained as ocean thermal energy. 2) These plants can operate if the temperature difference between the water at the surface and water at depths is up to 2 kms is 293K (20°c) or more. 3) It is used to boil and cool volatile liquids. 4) The vapours of the liquid are then used to run the turbine of a generator.	2 x 1	2

45	i)	1	2
	ii) A ray passing through the principal focus of a concave mirror after reflection will emerge parallel to the principal axis.	1	
46	**Fleming's right hand rule:** Stretch the thumb, forefinger and middle finger of right hand so that they are mutually perpendicular to each other. If the **forefinger** indicates the **direction of the magnetic field** and the **thumb** shows the **direction of motion of conductor**, then the **middle finger** will show the **direction of induced current**.		2
47	u= -25cm v=20cm lens formula $$\frac{1}{f} = \frac{1}{v} - \frac{1}{u}$$ $$\frac{1}{f} = \frac{1}{20} - \left(\frac{1}{-25}\right)$$ f = 11.11 cm focal length of the lens = 11.11 cm (Result + Unit)	1 ½ ½	2

SECTION – III
(Marks : 20)

Note : Answer any four questions by choosing one question from each part				4X5=20
		PART -I		5
48	a)	**Controlling Measures of Malaria (Any three points) :** i) Sanitary measures like ground fogging with disinfectants ii) Preventing water stagnation iii) Covering ditches and drains. iv) The use of mosquito nets and repellants	3	
	b)	**Symtoms:** Chills, Shivering, rise in temperature, destruction of spleen and liver tissues **(Any two Symptoms)**	2	
49	a)	1) Meninges 2) Vertebral column 3) Duramater 4) Arachnoid membrane 5) Pia mater	5X½= 2½	5
	b)	1) Myelinated (or)Medullated (or) White neurons 2) Non-myelinated (or) Non medullated (or) Grey neurons 3) Unipolar neurons 4) Bipolar neurons 5) Multipolar neurons	5X½= 2½	

PART – II

			Diagram 1	5

50   **DICOT SEED - Bean**

Parts 1

Any Six Points :

1. The seed is bulky, oval and slighty indented on one side.
2. On this side there is a short longitudinal, whitish ridge called the **raphae**
3. At one end of raphae there is a minute opening known as **Germ pore or micropyle**.
4. The embryo is enclosed by the **seed coat**.
5. It consists of cotyledons attached to primary axis.
6. It has rudimentary root portion called the **radicle** and a rudimentary stem portion called **plumule**.
7. The tip of the radicle projects outside and is nearer to the micropyle.
8. The plumule is placed between **two cotyledons**.
9. It consists of a shoot axis and a small bud with **tiny little folded leaves**.

6 X ½ = 3

51	a)	**Green Chemistry**		5

Green Chemistry is the design of chemical products and the processes to **reduce or eliminate the use and generation of hazardous substances**.

2

   b)   **Future Products**

i) A raw material feedstock should be renewable rather than depleting, whenever technically and economically practical.
ii) Catalytic reagents are superior to stoichiometric reagents.
iii) Green Chemistry is applicable to all aspects of the product life cycle as well. It is important to note that green chemistry is a way of dealing with risk reduction and pollution prevention.

3

PART – III

52	**Modern Atomic Theory** (Any Five Points)	5 X 1	5

i) Atom is the smallest particle which takes part in a chemical reaction.
ii) Atom is a divisible particle.
iii) Atoms of the same element may not be similar in all respects. e.g. **Isotopes.** (or) $_{17}Cl^{35}, _{17}Cl^{37}$
iv) Atoms of different elements may be similar is some respects. e.g. **Isobars** (or) ($_{18}Ar^{40}, _{20}Ca^{40}$)

		v) The ratio of atoms in a molecule may be fixed and integral but may not be simple. vi) Atoms of one element can be changed into atoms of another elements by transmutation vii) The mass of an atom can be converted into energy. $E=mc^2$		

53 — **Manufacture of ethanol from molasses :** — 5

i) Dilution :
Molasses is first diluted with water to bring down the concentration of sugar to about 8 to 10 percent. — 1

ii) Addition of ammonium salts:
If the nitrogen content of the molasses is poor, it may be fortified by the addition of ammonium sulphate (or) ammonium phosphate. — 1

iii) Addition of Yeast :-
Yeast is added to this solution and the mixture is kept at about 303K for few days. During this period the enzymes **invertase and zymase** present in yeast bring about the conversion of sucrose into ethanol. — 1

$$C_{12}H_{22}O_{11} + H_2O \xrightarrow{\text{Invertase}} C_6H_{12}O_6 + C_6H_{12}O_6$$

$$C_6H_{12}O_6 \xrightarrow{\text{Zymase}} 2C_2H_5OH + 2CO_2$$ — 1

The fermented liquid is technically called wash.

iv) Distillation of wash :
1. The fermented liquid containing 15 to 18 percent alcohol and the rest of the water is now subjected to fractional distillation.
2. The main fraction drawn is an aqueous solution of ethanol which contains 95.5% ethanol and 4.5% of water. This is called rectified spirit.
3. This mixture is then heated under reflux over quicklime for about 5 to 6 hours and then allows to stand for 12 hours. On distillation of this mixture pure alcohol (100%) is obtained. This is called absolute alcohol. — 1

PART - IV

54 a) An object remains in the state of rest or uniform motion in a straight line unless compelled to change that state by an applied unbalanced force. — 5 / 1

Examples :
i) We tend to remain at rest with respect to the seat, until the driver applies brake to stop the motor car.
ii) When we travel standing in a bus which begins to move suddenly. Now we tend to fall backwards. — 1

		(iii) When a motor car makes a sharp turn at a high speed, we tend to get through to one side. iv) If we hit the bottom coin of piles of coin on a carrom board, bottom coin moves out quickly. Once lowest coin is removed there, inertia of the other coins makes them fall vertically on the table without disturbing the pile. **(Likewise any one relevant example)**		

b) **Solution :**

$m_1 = 10kg$ $u_1 = 10\ ms^{-1}$ $V_1 = 4\ ms^{-1}$

$m_2 = 15kg$ $u_2 = 5\ ms^{-1}$ $V_2 = 9\ ms^{-1}$ $t=2s$

Force (action)

$$F_1 = \frac{m_2(v_2 - u_2)}{t} = \frac{15(9-5)}{2} = 30\ N \qquad 1$$

Force (reaction)

$$F_2 = \frac{m_1(v_1 - u_1)}{t} = \frac{10(4-10)}{2} = -30\ N \qquad 1$$

Action = - Reaction (or) $\therefore F_1 = -F_2$ $\qquad 1$

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55 **Defects of vision :**

The defects of vision are $\qquad$ 2

i) myopia (or) near sightedness

ii) Hyper metropia (or) far sightedness

iii) presbyopia.

a. Myopia (near sightedness)

A person with myopia can see nearby objects clearly and cannot see distant objects distinctly. $\qquad$ ½

Reason : i) Excessive curvature of eye lens

ii) Elongation of eye ball

Rectification : Using concave lens of suitable power $\qquad$ ½

b. Hyper metropia (far sightedness)

A person with this defect can see the distant objects clearly but cannot see the nearby objects. $\qquad$ ½

Reason : (1) The focal length of eye lens becomes too long.

(2) Eye ball becomes too small

Rectification : By using a convex lens with suitable power $\qquad$ ½

c. Presbyopia : The power of accomodation of eye usually decreases with ageing. For most people the near point gradually recedes they find it difficult to see nearby objects comfortable and distinctly. $\qquad$ ½

Reason : Gradual weakening of ciliary muscles and diminishing flexibility of eye lens.

Rectification : Can be corrected with bi-focal lenses. $\qquad$ ½

$\qquad$ 5

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