DEPARTMENT OF GOVERNMENT EXAMINATIONS
HIGHER SECONDARY SECOND YEAR EXAMINATION - MARCH – 2018
KEY ANSWERS FOR BIO-BOTANY

Note : 1. Answers written only in BLACK or BLUE should be evaluated
2. Choose the correct answer and write the option code
3. If one of them (option or answer) is wrong, then award zero mark only

SECTION – A Answer all the questions

Q. No	opt	TYPE - A	Q. No	opt	TYPE - B
1	c	Spiral	1	c	Hexose monophosphate pathway
2	c	Hexose monophosphate pathway	2	b	P 660
3	b	Datura	3	d	1970
4	a	Gamma rays	4	c	Spiral
5	a	Oxaloacetic acid	5	a	Cucurbitaceae
6	d	*Bacillus thuringiensis*	6	b	Datura
7	a	Quinine	7	b	Sclerenchyma
8	d	Beadle and Tatum	8	a	Quinine
9	b	P 660	9	a	Oxaloacetic acid
10	a	Cucurbitaceae	10	d	Ranales
11	b	Sclerenchyma	11	b	Blast disease of Rice
12	b	Blast disease of Rice	12	d	Beadle and Tatum
13	d	1970	13	a	Gamma rays
14	d	Ranales	14	d	*Bacillus thuringiensis*

SECTION – B **7 x 3 = 21**

Answer any Seven Questions

15	**Objectives of classification of plants.** i) To arrange plants in an orderly sequence based upon their similarities. ii) To establish phylogenetic relationship among the different group of plants.	1½ 1½	3
16	Inflorescence in Euphorbiaceae Inflorescence — Examples 1. Cyathium – *Euphorbia* 2. Panicle – *Ricinus communis* 3. Simple raceme – *Croton sparsiflorus* 4. Catkin – *Acalypha indica* 5. Solitary axillary cyme – *Phyllanthus amarus* (**Any Three**)	3x1	3
17	**Open vascular bundle** Diagram Labelling	2 1	3
18	**Eustele** In Dicot stem Vascular bundles are arranged in a ring around the pith	1 2	3

19	**Lamp brush chromosome** Diagram Labelling	2 1	3
20	**Electroporation** It is a process of creating temporary pores in cell membrane by application of electric field. **Uses** i) Introduction of foreign molecule such as DNA, RNA,Antibodies, drugs into cytoplasm ii) used widely to create Transgenic microorganisms, plants and animals. iii) used for application of gene therapy	1 1 1	3
21	**Photolysis of water** 1. Light dependent splitting of water molecules 2. PS II is in oxidized state 3. It creates a potential to split water molecules to protons, electrons and oxygen.	1 1 1	3
22	**Photooxidative damage** If enough CO_2 is not available to utilize light energy, excess energy causes damage to plant.	3	3
23	**Measurement of growth** Actual growth in length = $\frac{\text{Distance travelled by the pointer x Radius of the pulley}}{\text{Length of the pointer}}$	3	3
24	**Biomedicine** Medicinally valuable compounds obtained from the plants Antimalarial drug – ***Quinine*** The drug used to treat cough - ***Ephedrine***	1 1 1	3
	SECTION - C **Answer any four Questions** **Question No.25 is compulsory** **4 x 5 =20**		
25	**Five Salient features of ICBN(Any Five)** 1. The generic name is a noun. the specific epithet is an adjective 2. The name should be short, precise and easy to pronounce. 3. The binomials are printed in italics or underlined. *Abutilon neilgherrense* or Abutilon neilgherrense 4. Type specimen – Explanation 5. Author citation – Explanation 6. Ambiguous name – Explanation 7. Tautonym – Explanation 8. The original description of the plant should accompany the latin translation	5 x 1	5
26	**T.S. of Dicot Leaf :** Diagram Labelling : i)Mesophyll Palisade, Spongy ii) Bundle sheath iii) Stoma	3 ½ ½ ½ ½	5

27	**Gene mutation** Definition Deletion Addition Substitution i) Transition ii) Transversion	1 1 1 1 1	5
28	**Herbicide resistance in transgenic plants** 1. Effects of Herbicide 2. A gene which encodes an enzyme is isolated from Streptomyces hygroscopicus. 3. This enzyme is capable of inactivating herbicide "BASTA" 4. Transgenic plants with this gene have been developed demonstrating effectiveness of this gene for protection against the herbicide "BASTA". 5. Herbicide tolerant crop plants have now been developed by genetically manipulating plant genomes resistant to specific herbicides.	1 1 1 1 1	5
29	**Differences between C_3 and C_4 pathway** (see table below)	5 x 1	5
30	**CO_2 is liberated during aerobic respiration** Description Diagram Labelling	3 1 1	5
31	**Economic importance of groundnut** **(Any Five)** 1. Edible oil, Manufacture of vanaspathi 2. Kernel – Vegetable Protein 3. Soap making 4. Illuminant, Lubricant oil 5. Organic manure 6. Cattle feed 7. Groundnut shell – Activated carbon.	5 x 1	5

	C_3 pathway	C_4 pathway
1	Photosynthesis occurs in mesophyll cells.	Photosynthesis occurs in mesophyll and bundle sheath cells.
2	The CO_2 molecule acceptor is RuBP.	The CO_2 acceptor molecule is phosphoenol pyruvate.
3	The first stable product is a 3C compound called 3 – PGA.	The first stable product is a 4C compound called OAA.
4	Photorespiration rate is high and leads to loss of fixed CO_2. It decreases CO_2 fixation rate.	Photorespiration is negligible and it is almost absent. Hence, it increases CO_2 fixation rate.
5	Optimum temperature is 20 °C to 25° C.	Optimum temperature is 30 °C to 45°C.

	SECTION – D Answer any two Questions	2 x 10 = 20	
32	***Ricinus communis:***		
	1. Vegetative Characters: Habit, Root, Stem, Leaf	4x½=2	
	2. Inflorescence	1	
	3. Male flower description	2	
	4. Female flower description	2	10
	5. Male / Female floral diagram	2	
	6. Male / Female floral formula	1	
33	**Phloem**		
	Sieve elements description	2	
	Companion cell description	2	
	Phloem parenchyma description	2	10
	Phloem fibres description	2	
	Diagram	1	
	Labelling	1	
34	**Applications of tissue culture** **(Any ten Applications)**	10 x 1	10
35	**TCA Cycle** Flow Chart		10