DIRECTORATE OF GOVERNMENT EXAMINATIONS, CHENNAI -6

HIGHER SECONDARY EXAMINATIONS, MARCH 2011

PART I - BIO-BOTANY

MAX. MARKS: 75

SECTION – A

14 x 1 = 14

TYPE – A		TYPE – B	
1	a) Parenchymatous	1	a) Apical meristem culture
2	b) 130 mb	2	a) RUBP Carboxylase (or) b) PEP Carboxylase
3	d) Monosomy	3	a) 2ATP, $2NADH_2$
4	b) *Streptomyces hygroscopicus*	4	c) cytokinins
5	b) Azolla	5	a) 8 series, 36 families
6	d) *Cissus quadrangularis*	6	b) orchidaceae
7	a) 8 series, 36 families	7	b) Capsule
8	b) Orchidaceae	8	c) Amphivasal
9	b) Capsule	9	b) Azolla
10	c) Amphivasal	10	d) *Cissus quadrangularis*
11	a) Apical meristem culture	11	a) Parenchymatous
12	a) RUBP Carboxylase (or) b) PEP Carboxylase	12	b) 130 mb
13	a) 2ATP, $2NADH_2$	13	d) Monosomy
14	c) Cytokinins	14	b) *Streptomyces hygroscopicus*

SECTION – B

7 x 3 = 21

15. **AIMS OF BIO SYSTEMATICS** *3*

i) To delimit the naturally occurring biotic community of plant species

ii) To recognise the various groups as separate biosystematics categories such as ecotypes, ecospecies, cenospecies and comparium. (or)

To recognise the various groups as separate biosystematics categories

16 **FIBRE YIELDING PLANTS OF MALVACEAE** 3

i) Gossypium barbadense		1. Egyptian Cotton
ii)G. hirsutum	(or)	2. American Cotton
iii) *G. herbaceum*		3. Cotton
iv) Hibiscus cannabinus		4. Deccan hemp

17 **Three differences between the vascular bundles of dicot stem, monocot stem** *3*

Monocot stem	Dicot stem
1. Closed vascular bundle	1. Open vascular bundle
2. Vascular bundles are scattered	2. Vascular bundles are arranged in the form of a ring.
3. Skull shaped	3. Wedge shaped
4. Protoxylem lacuna present	4. Protoxylem lacuna absent
5. Phloem parenchyma is absent	5. Phloem parenchyma is present.

18 Any two types of collenchyma — 1 mark
Any Two types Description — 1+1 =2 marks *3*
i) Lamellar collenchyma Description
ii) Angular collenchyma Description
iii) Lalunate collenchyma Description

19 **Polytene Chromosome** *3*
Diagram - 2 marks
Labelling - 1 mark (any two parts)

20 P E G, Role — 1 ½ +1 ½
i) P E G - Poly Ethylene Glycol 1 ½ marks *3*
ii) Role: Used to fuse the parent protoplast / Fusogenic agent

21 **Photolysis of water** *3*
i) P S II is in oxidized state 1
ii) It creates a potential to split water molecules 1
to protons, electrons and oxygen.
iii) This light dependent splitting of water molecules is called photolysis of water 1

(or)

Splitting up of water molecules into Protons, Electrons and Oxygen by sunlight. 3

22 **Bolting** 3

sudden elongation of stem followed by flowering is called bolting

23 **Role of Enzymes**

a) Aldolase - 1 ½ mark 3

Fructose 1,6 bis phosphate is cleaved by the enzyme aldolase to two molecules of 3C compounds Glyceraldehyde 3 phosphate (G 3P) and Dihydroxy Acetone Phosphate (DHAP).

b) Succinyl COA synthetase - 1 ½ mark

Succinyl COA is hydrolysed to succinic acid in the presence of succinyl COA synthetase.

24 **Bio – pieracy** **Definition – 2 marks**
one example – 1 mark

i) The clandestine exploitation and utilization of bioresources from a country by several organizations and multinational companies without proper authorisation is known as biopiracy. 2 mark 3

ii) Example – any one – 1 mark

***Catheranthus roseus* / Basmathi rice / *Pentadiplandra brazzeana*. 1 mark**

SECTION – C (Any 4 Only) 4 x 5 = 20

Question No.25 is Compulsory

25 **Five salient features of ICBN (any five)**

1. The generic name is 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 under lined.

***Abutilon neilgherrense* or Abutilon neilgherrense.** 5

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.

26 26. Sieve element 5

Diagram	-	1 mark
Any two parts	-	1 mark
Explanation	:	3 marks

27 Structure of tRNA

Diagram	-	1 mark
Any two parts	-	1 mark
Explanation	:	3 marks

5

28 S C P, uses Definition : 2 marks

Cells from a variety of micro organisms used as food or feed called SCP – 2 marks

(or)

The dried cells of micro organisms used as food or feed

(or)

The isolated protein or the total cell material of a micro organism

5

Uses: Any – 3 3 x 1 = 3

i) It is a rich source of Protein, vitamins, amino acids, minerals and crude fibres.

ii) Popular health food

iii) Spirulina tablets are enriched vitamin for most people.

iv) It provide valuble protein – rich supplement in human diet.

v) Gamma – linolenic acid – lowers blood sugar level cholesterol in human body.

29 **Significance of pentose phosphate pathway**

i) It provides alternative route for carbohydrate breakdown.

ii) It generates $NADPH_2$ molecules which are used as reductants in biosynthetic processes.

iii) It provides ribose sugar for the synthesis of nucleic acids.

iv) It provides erythrose phosphate required for the synthesis of aromatic compounds. 5

v) It plays an important role in fixation of CO_2 in photosynthesis through Ru5P

30 **Physiological effects of Ethylene (any five)**

i) It prevents elongation of stem and root in longitudinal directions.

ii) Ethylene promotes positive geotropic growth of roots.

iii) Ethylene inhibits the growth of lateral buds in pea seedlings.

iv) It involved in ripening of fruits.

v) It stimulates the formation of abscission zone in leaves, flowers and fruits. 5

vi) Induce flowering in plants like Pineapple and Mango.

vii) Stimulates rooting of cuttings, Initiation of lateral roots and growth of root hair.

viii) It is responsible for breaking the dormancy of buds and seeds.

31 **Economic importance of Teak** 5

i) Teak wood is durable and it is an important timber in the tropics.

ii) Extensively used in making house hold furniture's.

iii) It is also used in ship building, boats etc.,

iv) It is used for Interior decoration

v) It is also used for the manufacture of boards.

Section – D

32 *Ricinus communis.*

1. Habit	2. Root	3. Stem
4. Leaf	Any two	2x1 = 2
5. Inflorescence	-1mark	
6. Male flower explanation	- 2 marks	
7. Female flower explanation	- 2 marks	10
8. Any one floral diagram	- Male / female – 2 marks	
9. Anyone floral formula Male / Female – 1 mark		

33. Internal structure of dicot leaf 10

Diagram	- 2 mark
Labelling any 4 parts	-4x ½ = 2 marks
Epidermis explanation	-1 mark
Mesophyll explanation	-3 marks
Vascular bundles explanation	-2 marks

34. Tissue culture 10

definition	-2 marks
Basic techniques	- (8 marks)
Culture vessel	- 1
Culture medium	- 1
Sterilization	- 1
Inoculation	- 1
Incubation	- 1
Induction of callus	- 1
Morphogenesis	- 1
Hardening	- 1

(Diagram not necessary)

35. 35. Calvin Cycle 10

Explanation - 10 marks

(or)

Flow chart - 10 marks