T.Y.B.Sc

21/04/23

**Time – 3 hr.** **Marks - 100**

**N.B.** 1. All questions are compulsory.
2. Draw neat labelled diagrams wherever necessary.
3. All questions carry equal marks.

**Q.1 Answer the following (any two)** **20**

a. Write a detail account of Indian Botanic Garden, Howrah.

b. Classify Combretaceae family giving reasons and mention the botanical names and economic importance of any two plants from the same family.

c. Explain with neat labeled diagrams the morphological features of the family Labiatae, give its importance and floral formulae.

d. Explain Hutchinson's system of classification with emphasis on its phylogenetic nature.

**Q.2 Answer the following (any two)** **20**

a. Citing suitable examples, describe the morphological and anatomical adaptations shown by Submerged Hydrophytes towards the aquatic ecosystem.

b. Highlight the typical adaptations of Halophytes towards saline Ecosystem.

c. What are Epiphytes? Describe the various ecological modifications observed in them with suitable examples.

d. Compare external and internal features of Xerophytes and Mesophytes.

**Q.3 Answer the following (any two)** **20**

a. Describe the process of megasporogenesis in Angiosperm with the help of neat and labeled diagrams.

b. What is double fertilization? Describe the process briefly.

c. Explain the stages in the development of *Capsella* type of embryo.

d. Describe the development of male Gametophyte in angiosperms.

**Q.4 Answer the following (any two)** **20**

a. Giving suitable examples write a detailed note on any 2 phytogeographical regions of India studied by you.

b. What is conservation of Biodiversity? What are the various approaches that can be adopted to conserve Biodiversity?

c. Write notes on: Tropical Dry Evergreen Forests and Tropical Dry Deciduous Forests.

d. Elaborate on the molecular methods used for assessing genetic diversity.



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**Q.5 Write Short note on the following (any four)** **20**

a. Economic importance of Family Euphorbiaceae

b. Merits of Hutchinson's system of classification

c. Sciophytes

d. Microspore tetrad

e. Oenothera embryo sac

f. Species Diversity

-x-x-x-x-x-



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Time: 3 Hours Marks: 100

**Instructions:**

1. **All questions are compulsory.**
2. **Figures to the right indicate full marks.**
3. **Draw neat labelled diagrams wherever necessary.**
4. **Use of a simple, non-programmable calculator is allowed.**

**Q1. Answer any TWO of the following:** (20)

A) What are Carbohydrates? Explain the structure of different aldose sugars studied by you.

B) Define Proteins and describe their general structure. How are they classified?

C) Compare and contrast the mechanisms of competitive and non-competitive inhibition in enzyme kinetics.

D) What are enzymes? Classify them according to IUB classification citing suitable examples.

**Q2. Answer any TWO of the following:** (20)

A) Describe the structure and activity of Nitrogenase enzyme complex.

B) Explain in detail the steps involved in the formation of root nodules.

C) Write a note on the commercial applications & physiological effects of Cytokinins as growth regulators.

D) Explain the role of Abscisic acid as a growth regulator.

**Q3. Answer any TWO of the following:** (20)

A) What are point mutations? Explain missense and nonsense mutations with examples.

B) What are mutagens? Explain the role 5BU as a mutagen.

C) Explain the molecular basis of PKU?

D) Draw the map of three genes (sc s and v) showing the distance between all pairs of genes by finding out the correct gene order.

| | | | |
|---|---|---|---|
| sc | s | v | 314 |
| + | + | + | 280 |
| + | s | v | 150 |
| sc | + | + | 156 |
| sc | + | v | 46 |
| + | s | + | 30 |
| sc | s | + | 10 |
| + | + | v | 14 |

**Q4. Answer any TWO of the following:** (20)

A) Three varieties of wheat were sown in 4 plots each and the following yields in quintal per acre were obtained. Analyze with **ANOVA** whether the three varieties differ in yields or not.

| A | B | C |
|---|---|---|
| 8 | 7 | 2 |
| 4 | 5 | 5 |
| 6 | 5 | 4 |
| 7 | 3 | 4 |

(Tabulated F at 5%= 4.26)



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B) Number of seeds (x) and length of pod (y) are given below. Calculate the **regression coefficient b.**

| x | 1 | 1 | 2 | 5 | 4 | 6 | 3 | 2 | 3 | 4 |
|---|---|---|---|---|---|---|---|---|---|---|
| y | 2.0 | 1.5 | 2.0 | 4.5 | 5.0 | 7.0 | 4.0 | 3.0 | 3.0 | 4.5 |

C) Albino rats were given a drug for 7 days. Their body weight was measured before and after exposure to the drug. Analyse whether the drug has any effect on body weight with the help of **paired t – test.**

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Before | 110 | 115 | 102 | 98 | 112 | 110 | 97 | 120 | 102 | 110 |
| After | 109 | 116 | 100 | 95 | 108 | 112 | 98 | 115 | 98 | 111 |

(Tabulated t at 5%= 2.26)

D) In order to find effect of *Azolla* growth on rice yield, *Azolla* was grown in ten plots before rice planting. Ten similar plots were taken as control without *Azolla* growth. The yield of rice is given in the table. Verify with **unpaired t –test** whether there is effect of *Azolla* growth on rice yield.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| With | 15.3 | 15.8 | 16.1 | 17.0 | 15.5 | 16.5 | 16.2 | 15.5 | 17.1 | 16.3 |
| Without | 14.5 | 13.8 | 15.9 | 13.9 | 14.8 | 14.9 | 15.2 | 15.0 | 14.1 | 13.7 |
| | | | | | | | | | | |

(Tabulated t at 5% = 2.10)

**Q5. Write short notes on any FOUR of the following:** (20)

a) Km
b) Saturated fatty acids
c) Denitrification
d) Commercial applications of Auxins
e) Incomplete linkage
f) UV light as a mutagen
g) Degree of freedom in ANOVA
h) Applications of t – test

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