Time – 2 ½   **Marks - 75**

N.B.   1. All questions are compulsory.
            2. Draw neat labelled diagrams wherever necessary.
            3. All questions carry equal marks.
            4. Use of simple calculator is allowed

Q.1   Attempt any two   **15**
a   Describe the structure and function of nucleolus.
b   Give an account of structure of vacuole in plant cells. Add a note on its contents.
c   Give detail account on giant chromosomes.
d   Describe the characteristics of genetic code.

Q.2   Attempt any two   **15**
a   Describe the role of gibberellins as a plant growth regulator.
b   Describe a process of phloem loading and unloading.
c   What is meant by passive transport? Describe the various modes of passive transport of
    solutes in plants.
d   What are micro and macro nutrients? Describe the functions and deficiency symptoms of any
    one macro and micronutrient studied by you.

Q.3   Attempt any two   **15**
a   What is meant by bioremediation? Discuss the principle involved in bioremediation.
b   What is biomagnification? Discuss its significance with case studies in an aquatic ecosystem.
c   What is phytoremediation? Discuss the various processes involved in phytoremediation of
    organic pollutants.
d   What is bioremediation? Add a note on microbial population in bioremediation.

Q.4   Attempt any two   **15**
a   The following is the data obtained in an experiment

Sr. No	Mg of protein (X)	Absorbance (O.D.) (Y)
1	0	0.05
2	0.1	0.2
3	0.2	0.25
4	0.3	0.3
5	0.4	0.35
6	0.5	0.4
7	0.6	0.45
8	0.7	0.5
9	0.8	0.55
10	0.9	0.6

Find the linear regression equation of mg of protein (X) on absorbance (Y). also find out the
mg of protein when O.D. is 0.38

Page **1** of **2**

53848

b

In order to find the effect of Azolla growth on the rice field and experimentally grown Azolla in 10 similar field plots before rice planting And other 10 similar plots were taken as control without Azolla growth. Rice was grown in all these plots and yields were noted

Plots No	1	2	3	4	5	6	7	8	9	10
With Azolla	15.3	15.8	16.1	17.0	15.5	16.5	16.2	15.5	17.1	16.3
Without Azolla	14.5	13.8	15.9	13.9	14.8	14.9	15.2	15.0	14.1	13.7

c   The following data gives the yield on 12 plots of lands in 3 samples under 3 varieties of fertilizers. Is there any significant difference in the three varieties of fertilizers? Analyze with ANOVA.

A	B	C
25	20	24
22	17	26
24	16	30
21	19	20

(Tab F at 5% = 4.26)

d   In a nutritional study, 13 children were given a diet of vitamin A & D while another group of 12 students were taking their natural diet. Analyze with unpaired t-test if there is change in weight gain.

A	5	3	4	3	2	6	3	2	3	6	7	5	3
B	1	3	2	4	2	1	3	4	3	2	2	3	-

(Tab t at 5% = 2.07)

Q.5 Attempt any three   **15**
a   Initiator codon and initiator t-RNA
b   Heterochromatin and euchromatin
c   Osmosis
d   Concept of Source and sink.
e   Phytoextraction
f   Significance of ANOVA

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53848

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