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M. Sc. Examination, 2022  
Semester – I  
Biotechnology  
Paper – V  
(Cell Biology, Biochemistry, Genetics and Molecular Biology)

Time: 6 hours x 2 days

Full marks: 80

Questions are of values as indicated in the margin

1. Estimate the concentration of the cells in the given sample of cell suspension by counting under microscope appropriately showing your counting and calculation. Derive the formula for your counting explaining with proper diagrams.

7.5+7.5=15

2. Identify reducing and non-reducing sugars from the given samples labelled A-L. Prepare the appropriate solutions for executing the experiments from the provided reagents. Give the scientific explanation for preparation of the reagents and the results.

7+4+4=15

3. Quantify the amount of DNA in supplied sample (M) with help of a spectrophotometer. Comment on the purity of the provided sample.

6+4=10

4 (a) What do you mean by "chi square" test? (b) What is the importance of this test in Genetics. (c) From the supplied F<sub>2</sub> progeny (N) develop a genetic model for inheritance pattern. (d) From the inheritance pattern perform a chi square test to test whether the inheritance pattern follow the typical Mendelian principle or not using proper statistical test? (e) Also show how the probability rules of multiplication and addition are followed in your genetic model.

3+3+4+5+5 = 20

5. Viva voce

10

6. Laboratory notebooks

10