

ASUTOSH COLLEGE
DEPARTMENT OF BOTANY
BOTANY HONOURS
 B.Sc. SEMESTER V : (CBCS UNDER CU)
 CORE COURSE - 11
 CELL AND MOLECULAR BIOLOGY
 (BOT-A-CC-5-11-P)

FULL MARKS :30

TIME : 1hr30mins

ANSWER **ANY THREE** OF THE FOLLOWING QUESTIONS

- Write down the steps for observing the plant cell from onion scale under microscope. How will you measure those cells under microscope? Find out the relation between ocular and stage micrometre from the following observation, and also calculate the cell measurement in micron from the table given below.

TABLE 1 : To find the relation between ocular and stage micrometre at 40 x

Ocular division	12	26	40	52	66
Stage division	5	10	15	20	25

TABLE 2 : Observation table of length and width of 5 different cells at 40 X

Length ocular division	57	68	74	77	64
Width ocular division	5	6	7	7	6

$$3+2+5=10$$

- Write down the procedure of DNA estimation by DPA method through a flow chart. Prepare a distribution table for estimation DNA in a solution using 500 μ g/ml stock solution in 5 tubes containing 50 μ g, 100 μ g, 150 μ g, 200 μ g, 250 μ g of DNA.

Draw the standard curve on a mm graph paper according to the OD values given in the observation table, and estimate the amount of DNA present in the unknown samples from the standard curve .

Amount of DNA	50 μ g	100 μ g	150 μ g	200 μ g	250 μ g	Unknown SAMPLE A	Unknown SAMPLE B
OD value at 600nm	0.016	0.029	0.04	0.052	0.065	0.035	0.07

$$3+2+3+2=10$$

- Write down the procedure of Nucleolus staining using Haematoxylin dye in *Allium cepa* root tip tissue with the help of a flow chart. Calculate the Nucleolar frequency of the tissue observed under microscope from the observation table given below.

No. of observation	Total no. of cells observed	Cells with one nucleolus	Cells with two nucleolus	Cells with three nucleolus
1.	43	30	13	0
2.	45	34	11	0
3.	39	27	11	1
4.	47	29	15	3
5.	44	28	14	2

5+5=10

4. a. Write down the formula used to find out the number of cells or pollen present in a suspension with the help of Haemocytometer?

b. State the principle of staining of DNA and RNA component of a cell with the help of Methyl Green –Pyronine Staining method.

c. **Write a brief note with proper diagram on any one of the topic given below**

i. Rolling circle model of replication

ii. Theta replication of DNA

iii. Semi-discontinuous replication

iv. Prokaryotic RNA Polymerase & Eukaryotic RNA Polymerase II

v. Assembly of Spliceosome machinery

vi. Splicing mechanism in group I and group II introns

vii. Ribozyme and Alternative Splicing

2+2+6=10

SEND YOUR ANSWER SCRIPTS IN FOLLOWING EMAIL ID WITHIN 4 P.M.

asutoshbotany@gmail.com