2021

BOTANY — HONOURS

Sixth Paper

Full Marks : 100

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Module - XI

(Marks : 50)

1. Answer the following questions :

(a) Define ribozyme with an example. 2

(b) What is emasculation? State its importance. 2

(c) State the functions of kinetochore. 2

(d) Define apoptosis. 1

(e) State the laws of probability. 2

(f) What is student's t-test? 1

2. Describe the ultrastructural features of nucleolus. Explain briefly the different steps of ribosome biogenesis. 7+8

Or,

Write short notes on the following : 5×3

(a) Chloroplast DNA

(b) Origin of eukaryotic cell

(c) Karyotype concept and its parameters.

3. Answer ***any two*** of the following :

(a) What is male-sterility in plant breeding? Explain, in brief, the different types of male sterility. 1+4

(b) Distinguish between mass selection and pure-line selection. 5

(c) Explain the laws of probability with examples. 5

(d) In 10 plots of the same size, the number of wilted pigeon-pea plants were as tabulated below :

Plot Number	1	2	3	4	5	6	7	8	9	10
Number of Plants	58	59	65	68	66	63	66	61	65	59

Calculate the mean, standard deviation and standard error of the number of wilted plants. 1+2+2

4. Describe the method used for obtaining haploid plants by anther culture. State the importance of haploid culture. Why pollen culture is advantageous than anther culture in haploid production? 9+3+3

Or,

Answer the following : 5×3

(a) Write a note on applications of callus culture.

(b) Differentiate between zygotic and somatic embryogenesis.

(c) Briefly, discuss the importance of protoplast culture in crop improvement.

Module - XII

(Marks : 50)

5. Answer the following questions :

(a) Define complete and incomplete linkages. 2

(b) Distinguish between pericentric and paracentric inversions. 2

(c) What is semi-conservative replication of DNA? 1

(d) Name the enzyme required for PCR and name its source. 2

(e) Give an example of reporter gene. 1

(f) Differentiate between dominance and epistasis. 2

6. Discuss in brief ***any two*** of the following : 5×2

(a) Processing of mRNA in eukaryotes

(b) Cytological basis of crossing over

(c) Negative control of Lac-operon

(d) Ac-Ds system in maize.

7. Answer ***any two*** of the following :

(a) Mention the different properties of genetic code. Discuss the triplet binding technique for deciphering the genetic code. Explain Wobble hypothesis. 6+5+4

(b) What is translocation? What are the different types of translocation? Explain the meiotic configurations of a translocation heterozygote and its subsequent effect on pollen viability. 2+2+8+3

(c) What is tautomerism? Briefly discuss its role in causing point-mutation. Compare the mutagenic effects of an alkylating agent and a base-analogue. 2+5+8

(d) A cross is made between a heterozyogote ABC/abc and a recessive homozygote abc/abc. 1280 progenies were analyzed, giving the results below :

ABC	–	413	Abc	–	170
abc	–	426	aBc	–	161
ABc	–	6	AbC	–	47
abC	–	3	aBc	–	54

Determine the order of genes A, B, C, distances between them and coincidence and interference. 2+10+3