2016

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

(50 Marks)

1. Answer the following questions :
   (a) What is NOR? State its function. 2
   (b) Mention the chemical composition of chromatin. 2
   (c) Define Kinetochore. 1
   (d) Explain Null hypothesis. 2
   (e) Define Goodness of fit. 2
   (f) State the importance of inbreeding. 1

2. What are the different check points in Yeast Cell cyle? How are these controlled? Give a brief idea on Apoptosis. 3+7+5

Or

Write short notes on the following : 5×3

(a) Organeller DNA
(b) Structure and function of telomere
(c) Role of nucleosome in packaging of DNA molecule.

3. Answer ***any two*** of the following :
   (a) State the differences between mass selection and pure-line selection. 5
   (b) What is hybrid vigour? Explain the genetic basis of heterosis. 5
   (c) Discuss different methods of germplasm maintenance. 5
   (d) In 10 plots wheat plants with rust disease were counted as follows :

Plot number	1	2	3	4	5	6	7	8	9	10
Number of wheat plants with rust disease	50	54	59	64	68	55	65	60	69	74

Calculate the standard deviation and standard error. 3+2

4. What is osmoticum? Illustrate the method of protoplast isolation. Discuss the different techniques of protoplast culture. 2+6+7

Or

Answer the following : 5×3

(a) What is embryo rescue? Compare zygotic and somatic embryogenesis.

(b) With suitable flow chart enumerate somatic hybridization with diagrams.

(c) Mention the steps in *Agrobacterium* mediated gene transfer.

Module – XII

(50 Marks)

5. Answer the following questions :

(a) What is the basic difference between Mendelian inheritance and Epistasis? 2

(b) State the role of RecA in crossing over. 2

(c) Why is Frame-shift mutation more harmful than base pair substitution? 2

(d) What is spliceosome? 2

(e) Write down the full form of LINES. 1

(f) Give an example of helicase. 1

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

(a) Define transposon. Explain Ac-Ds system in maize.

(b) Meiotic behaviour of paracentric and pericentric inversion with sketches.

(c) Dynamics of replication fork in an eukaryotic organism.

(d) Define gene cloning. Enumerate the properties of an ideal gene cloning vector.

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

(a) What do you mean by aminoacylation of t-RNA? Discuss the translation process in prokaryotes. 3+12

(b) Define Genetic Code. Write down the properties of genetic code with proper explanation and suitable examples. Discuss the Binding technique of decipherence of codons. 1+9+5

(c) What is crossing over and where does it occur? Describe the Holliday Model of molecular mechanism of crossing over with proper illustrations. 3+12

(d) A plant heterozygous for AaBbCc was crossed to aabbcc and 1000 progenies were classified as follows :

ABC – 44, abc – 43 ; AbC – 148, aBc – 150 ; Abc – 305, aBC – 310 ; ABc – 0, abC – 0.

(i) Calculate the map distance and find out the order of genes through recombination frequency determination.

(ii) Do you consider that mapping function calculation is required here to get an accurate map distance between the genes? Justify your answer.

(iii) Is there any interference between the crossing overs? Prove your statement. 2+8+2+3