

2018
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 the full form of SCAR? | 1 |
| (b) What is NOR? State its function. | 2 |
| (c) How does apoptosis differ from necrosis? | 2 |
| (d) State two important factors that affect Hardy-Weinberg equilibrium. | 2 |
| (e) Define goodness of fit. Write the formula of Chi-square. | 2 |
| (f) Define cytoplasmic male sterility. | 1 |
2. Discuss with labelled sketches the role of MPF in cell-cycle regulation in yeast. Briefly state the controlling mechanisms of different check points during interphase. Write a brief note on the packaging of DNA in eukaryotic chromosome on the basis of nucleosome concept.

6+3+6

Or

Write short notes on the following :

5×3

- | | |
|---|--|
| (a) Structural organization of telomere | |
| (b) Chloroplast DNA | |
| (c) Karyotype concept and its parameters. | |
3. Answer *any two* of the following :
- | | |
|--|-----|
| (a) What is hybrid vigour? Explain the genetic basis of heterosis. | 1+4 |
| (b) Explain the laws of probability with examples. | 5 |
| (c) Distinguish between mass selection and pure-line selection. | 5 |
| (d) Find the mean and standard deviation of the following data : | 5 |

Length of seeding(cm)	10	11	12	13	14	15	16
Frequency	2	7	11	15	10	4	1

[Turn Over]

4. State the role of osmoticum in protoplast isolation. Explain the different methods of protoplast fusion. What is cybrid? Mention the different applications of somatic hybrid. 3+5+2+5

Or

Answer the following : 5×3

- (a) Distinguish between organogenesis and somatic embryogenesis.
 (b) Explain briefly the different stages involved in micropropagation technique.
 (c) Enumerate briefly the different direct gene transfer methods in plant transformation.

Module – XII

(50 Marks)

5. Answer the following questions :
- | | |
|--|---|
| (a) Differentiate between dominance and epistasis. | 2 |
| (b) What is homoeotic gene? Give an example. | 2 |
| (c) Distinguish between genomics and proteomics. | 2 |
| (d) What is TATA box? | 1 |
| (e) Name the enzyme required for PCR and mention its source. | 2 |
| (f) Give an example of reporter gene. | 1 |
6. Discuss in brief *any two* of the following : 5×2
- (a) Processing of mRNA in eukaryotes.
 (b) Meiotic behaviour of paracentric and pericentric inversions with suitable examples.
 (c) Ac-Ds system in maize.
 (d) Comparison between genomic and cDNA library preparations.
7. Answer *any two* of the following :
- (a) Explain amino-acylation of tRNA. Describe with labelled sketches the different steps in prokaryotic translation process. 3+12
- (b) Mention the different properties of genetic code. Discuss the triplet-binding technique for deciphering the genetic code. Explain Wobble hypothesis. 6+5+4
- (c) Distinguish between euploidy and aneuploidy. State the different types of aneuploidy, their origin and meiotic behaviour. Explain the importance of amphidiploidy in the origin of *one* crop species. 2+10+3
- (d) A cross was made between purple leaf (pl), glossy seeding (gl), dwarf (t) variety and wild type. F₁ plants were test-crossed and the following proportions were obtained when 3000 plants were counted :
- +++ -875; pl gl t -889; pl ++ -102; +gl t -109; pl+t -496; +gl+ -506; ++t -12; pl gl + -11.
- (i) Calculate the map distance and find out the gene order.
 (ii) Determine the coefficient of coincidence and interference. (8+2)+(3+2)