

## FINAL YEAR B.Sc. DEGREE EXAMINATION, MARCH/APRIL 2005

## Part III—Group IV—Botany

Paper VI—CYTOLOGY, GENETICS, PLANT BREEDING, BIOTECHNOLOGY,  
BIOSTATISTICS, BIOMETRICS AND COMPUTER APPLICATION

Time : Three Hours

Maximum : 60 Marks

*Answers may be written either in English or in Malayalam.*

## I. Answer any ten of the following :

- 1 Who proposed cell theory ?
- 2 Explain centric fusion.
- 3 What is dictyosome ?
- 4 Name the recent model of the structure of plasma membrane. Who proposed it ?
- 5 What are allopolyploids ?
- 6 What are B chromosomes ?
- 7 Define a test cross.
- 8 ~~What are the types of gametes produced by a plant with genotype Rr Tt ?~~
- 9 What is multiple allelic inheritance ?
- 10 Define central dogma.
- 11 Name two pyrimidines.
- 12 What is a NIF gene ?
- 13 Name the person proposed the concept of centers of origin of crop plants.
- 14 What is the main contribution of Haberlandt ?
- 15 What are plasmids ?

(10 × 1 = 10 marks)

## II. Answer any ten of the following :

- 16 How heterosis can be employed in plant breeding ?
- 17 Explain the basic organisation of a computer.
- 18 Expand BASIC and FORTRAN.
- 19 Explain redifferentiation.
- 20 What are cybrids ?
- 21 Explain the transgenic plants.
- 22 Define law of dominance.
- 23 Give a genetic explanation for Klinefelters syndrome.
- 24 Explain complementary interaction.
- 25 What are the characteristics exhibited by quantitative inheritance ?

Turn over

- 26 Explain repressors.
- 27 What are isotopes ? Mention two applications of isotopes in plant research.
- 28 List out the important structural variations in chromosomes.
- 29 Describe the structure of Lampbrush chromosomes.
- 30 What are the points to be remembered while selecting a fixative ?

(10 × 2 = 20 marks)

III. Answer any *two* of the following :

- 31 In *Mirabilis* plant when a red flowered plant was crossed with a white flowered plant three phenotypic expressions were produced in F<sub>2</sub> in the following proportion 28 red : 58 pink : 30 white. Explain.
- 32 The comb pattern of fowls exhibit non-epistatic inheritance. Find out the phenotypes, phenotypic ratio, genotypes and genotypic ratio of the offsprings of the following crosses.
  - (a) Rr PP × Rr Pp.
  - (b) rr Pp × Rr pp (R – Rose, P – Pea).
- 33 Diagram a cross between homozygous pea plant that produced yellow seeds (GG) and one that produced green seeds (gg). Carry to the F<sub>2</sub> and summarize the expected results under the following headings : Phenotypes, genotypes, genotypic ratio and phenotypic ratio.

(2 × 4 = 8 marks)

IV. Answer any *three* of the following :-

- 34 Name three important central tendencies give a brief account of each.
- 35 Discuss the genetic mechanism of inheritance, of skin colour in man.
- 36 Explain the procedure of pure line selection. Mention two achievements of pure line selection.
- 37 'DNA is the genetic material.' Substantiate with the help of experimental proofs.
- 38 Elaborate the inheritance of Kappa particles in *Paramecium*.

(3 × 4 = 12 marks)

V. Answer any *one* of the following :-

- 39 Give an illustrated account of the cell cycle.
- 40 "Phenyl ketonuria is a genetically controlled disease in man." Explain.
- 41 Write notes on the following :
  - (a) Recessive Epistasis.
  - (b) Mutation breeding.
  - (c) Phase contrast microscope.
  - (d) Crossing over.

(1 × 10 = 10 marks)