3 TDC (Special) BOT M 2

2016

(July)

BOTANY

(Major)

Paper : 30200

(Cell Biology, Genetics and Plant Breeding)

Full Marks : 81

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. *(a)* Express in ***1*** word : 1×3=3

   (i) Potentials of a cell to produce the whole organism

   (ii) Exchange of chromosomal parts between two non-homologous chromosomes

   (iii) A DNA sequence formed by a foreign DNA and a vector DNA

(b) Choose the correct answer : 1×3=3

(i) The size of an eukaryotic ribosome in Svedberg unit is 60S / 80S / 70S.

(ii) A DNA segment capable of changing its location within a chromosome or between chromosomes is called transposon / transition / translocation.

(iii) Reciprocal crosses in cytoplasmic inheritance show identical results / different results / no change.

(c) Fill in the blanks : 1×2=2

(i) Crossing of two plants belonging to the same species is called _____ cross.

(ii) Progeny developed from single self-fertilised homozygous plant is called _____.

2. Distinguish between the following pairs : 3+3+3+3+4=16

(a) Back-cross and Test-cross

(b) Crossing-over and Translocation

(c) Sex chromosomes and Autosomes

(d) Autopolyploidy and Allopolyploidy

(e) Nuclear inheritance and Cytoplasmic inheritance.

3. Describe with diagram, the fluid-mosaic model for the structure of cell membrane. Also give an account for various functions of cell membrane in living system. 5+5=10

Or

Describe in detail different types of RNAs present in living system. Discuss their structures and functions. 5+5=10

4. Write short notes on : ***(any three)*** 3×3=9

(a) Structure and functions of ribosomes

(b) Structure of polytene chromosome

(c) Embryoids

(d) Amphidiploid

(e) Somatic hybridization

5. Mendel's third law, 'the law of independent assortment' is not universal. Substantiate the statement with the examples of complete and incomplete linkage. 4+7=11

Or

What do you mean by transition and transversion ? Describe the mechanism of transitional mutation at molecular level. Also mention *any four* types of chemical mutagens. 2+7+2=11

6. Write short notes on : ***(any three)*** 4×3=12

   (a) Nilsson-Ehles experiment in kernel colour of wheat

   (b) Inhibitory factors

   (c) Genic balance theory of sex determination

   (d) Back-cross method of plant breeding

   (e) Cloning vectors

7. What are conventional and non-conventional methods of plant breeding ? Which method is more suitable in your opinion and why ? Also write an account on the method of mass selection and its uses. 2+3+8+2=15

Or

Write explanatory notes on : 7½×2=15

(a) Mutation breeding

(b) Dominance and over-dominance hypotheses of heterosis
