**B.Sc. (Part–II) Semester—IV Examination**

**BOTANY**

**(Cell Biology, Genetics and Biochemistry)**

Time : Three Hours] [Maximum Marks : 80

**N.B. :—** (1) There are **seven** questions in all.

(2) Question No. **1** is compulsory and carries **8** marks.

(3) Q. **2** to Q. 7 carry equal marks.

(4) Draw well labelled diagrams wherever necessary.

1. (A) Fill in the blanks :

(i) Power house of cell is called as _____. ½

(ii) The division of cytoplasm during cell division is called as _____. ½

(iii) Ribosomes are site of _____. ½

(iv) The Mendel's monohybrid phenotypic ratio is _____. ½

(B) Choose the correct alternative (MCQ) :

(v) Chromosomes are best seen in :

(a) Interphase

(b) Prophase

(c) Metaphase

(d) Telophase ½

(vi) Glucose is :

(a) Pentose sugar

(b) Hexose sugar

(c) Heptulose sugar

(d) Tetrose sugar ½

(vii) Mendel worked on :

(a) *Pisum sativum*

(b) *Cajanus cajan*

(c) *Lathyrus odoratus*

(d) *Zea mays* ½

(viii) $F_1$ particles are also known as :

(a) Oxysomes

(b) Ribosomes

(c) Lysosomes

(d) Peroxisomes ½

(C) Answer in one sentence :

(ix) Define eukaryotic cell. 1

(x) What is synapsis ? 1

(xi) What is Test Cross ? 1

(xii) Define Mutation. 1

2. Explain :

(a) Difference between prokaryotic cell and eukaryotic cell 4

(b) Structure of cell wall. 4

(c) Function of Chloroplast. 4

**OR**

(d) Fluid mosaic model of plasma membrane 4

(e) Functions of Nucleus 4

(f) Structure of Chloroplast. 4

3. Comment on :

(g) Structure of endoplasmic reticulum 4

(h) Functions of Mitochondria 4

(i) Pachytene. 4

**OR**

(j) Difference between mitosis and meiosis 4

(k) Functions of Golgi Complex 4

(l) Structure of Ribosome. 4

4. Describe structural aberrations of chromosomes. 12

**OR**

Explain :

(m) Allopolyploidy 6

(n) Types of chromosome on the basis of centromere position. 6

5. Explain :

(o) Law of segregation with suitable example. 6

(p) Complementary factor. 6

**OR**

In Sorghum white midrib (D) is dominant over dull green midrib (d) and pearly grain (A) is dominant over chalky grain (a).

What are the phenotypic ratios of the following crosses ?

(i) DDAa × DdAA

(ii) DDaa × ddAa

(iii) DdAa × DdAa

(iv) ddAA × DdAa 12

6. Explain :

(q) Chromosome theory of linkage 4

(r) Types of crossing over 4

(s) Chloroplast DNA. 4

**OR**

(t) Coupling and Repulsion theory of linkage 4

(u) Concept of crossing over 4

(v) Induced mutation. 4

7. Comment on :

(w) Concept of holoenzymes 4

(x) Structure of disaccharides 4

(y) Lock and key theory of enzyme action. 4

**OR**

(z) Characteristics of enzymes (any **two**) 4

(a) Functions of Monosaccharides 4

(b) Lyases. 4