



Seat No. _____

HN-1603120102020400

**M. Sc. (Biochemistry) (Sem. II) (CBCS)
(W.E.F. 2016) Examination**

April - 2023

**CBC - 4 : Cell Biology & Genetics
(Old Course)**

Time : $2\frac{1}{2}$ Hours / Total Marks : 70

- 1 Answer briefly any **seven** of the following questions : **14**
- (1) Write the important functions of Golgi complex body in plant and animal cells.
 - (2) Define simple diffusion and give examples of substances transported across membrane by simple diffusion.
 - (3) What are induced pluripotent stem cells?
 - (4) Define gastrulation.
 - (5) Describe action of insulin via tyrosine kinase receptor activity.
 - (6) How did the secondary messenger cyclic AMP gets inactivated once its action is over?
 - (7) What is the importance of G₀ phase of cell cycle?
 - (8) Differentiate between oncogenes and proto-oncogenes.
 - (9) Explain the term "Co-dominance".
 - (10) What are dominant and recessive alleles?
- 2 Answer any **two** of the following questions in detail : **14**
- (a) Discuss Fluorescence Recovery After Photo bleaching (FRAP) experiment and explain how it could be used to study lateral movement of proteins in the plasma membrane.
 - (b) Describe structure, composition and functions of mitochondria in animal cells.
 - (c) Discuss structure, components, and organization of microtubules.

- 3 (a) Write short note on G-protein coupled receptor mediated signal transduction. 7
- (b) Discuss the role of maternal genes in anterior posterior region formation. 7

OR

- 3 (a) Define secondary, messengers. Discuss different types of secondary messengers. 7
- (b) Discuss in detail; segmentation genes and homeotic genes. 7

- 4 Answer the following questions in detail : 14
- (a) Discuss various stages of cell cycle and the important checkpoints of a cell cycle.
- (b) Describe using suitable diagrams the process of either mitosis or meiosis and write its physiological significance.

- 5 Answer any **two** of the following questions in detail : 14
- (a) Discuss Epistasis and explain how it affects pigmentation and determine color of the fur in mice?
- (b) Explain in detail the mechanism of homologous recombination and its importance.
- (c) Write Hardy - Weinberg principle and Discuss deviations from Hardy-Weinberg equilibrium.
- (d) Describe the Laws of Segregation and Independent assortment with suitable examples.