

(3 Hours)

[ Total Marks : 80

- N.B. : (1) Question No. 1 is compulsory.  
 (2) Attempt any three questions from Q. Nos. 2 to 6  
 (3) Draw neat labelled diagram wherever necessary.

1. Write short notes on the following. 20
  - a) Intrinsic programming in the embryo development
  - b) Transit-amplifying cells
  - c) Process of sequential induction
  - d) Properties of stem cells
2.
  - a) Explain how regulatory mutations transform plant topology? 10
  - b) Why Arabidopsis serves as a model organism for plant molecular genetics? 10
3.
  - a) Write a note on the renewal of epithelial cells explaining the underlying genetic mechanism. 10
  - b) Cell fate in the developing nematode is predictable. Explain. 10
4.
  - a) Discuss the mechanism of cell proliferation and specialization? 10
  - b) Explain the hematopoietic stem cell as multipotent stem cell? 10
5.
  - a) Discuss the potential use of stem cells in Diabetes treatment? 10
  - b) Discuss Genetically modified stem cells and gene therapy? 10
6.
  - a) What are the similarities and differences between embryonic and adult stem cells? 5
  - b) Explain totipotent, multipotent, pluripotent and unipotent cells? 5
  - c) Describe the methods used for generating stem cells? 10