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18BT35

Third Semester B.E. Degree Examination, Feb./Mar. 2022

**Cell Biology and Genetics**

Time: 3 hrs.

Max. Marks: 100

*Note: Answer any FIVE full questions, choosing ONE full question from each module.*

**Module-1**

- 1 a. With a neat diagram, explain the structure of animal cells. (10 Marks)  
b. Write short notes on the chemical composition and formation of microfilaments. (10 Marks)

OR

- 2 a. Explain in details the models of plasma membrane with special reference to fluid mosaic model. (10 Marks)  
b. What are microtubules? Describe their structures, assembly, disassembly and functions. (10 Marks)

**Module-2**

- 3 a. Explain in detail the structure and function of nucleus. (10 Marks)  
b. Explain mitosis with diagram and also mention how Meiosis – I differs from mitosis. (10 Marks)

OR

- 4 a. Explain in detail the types of cell to cell interaction in plants and animals. (10 Marks)  
b. Write short notes on: (i) Apoptosis (ii) Amoeboid movement (10 Marks)

**Module-3**

- 5 a. Write short notes on law of dominance. (05 Marks)  
b. Define epistasis and explain it with an example. (05 Marks)  
c. Give expected genotypic and phenotypic ratios for the following crosses for ABO blood groups: (i)  $I^A I^O \times I^B I^O$  (ii)  $I^A I^B \times I^A I^O$  (iii)  $I^A I^B \times I^A I^B$  (iv)  $I^O I^O \times I^A I^O$  (10 Marks)

OR

- 6 a. "DNA is genetic material rather than protein". Justify the statement with Hershey Chase and Griffith experiment. (10 Marks)  
b. Define Gene interactions. Explain complementary and supplementary gene interaction with examples. (10 Marks)

**Module-4**

- 7 a. Explain with a neat diagram the morphological structure of chromosome. (10 Marks)  
b. What is speciation and explain about the types of speciation. (10 Marks)

OR

- 8 a. Write short notes on heterosis and pedigree analysis. (10 Marks)  
b. Define mutation and explain the different types of mutation. (10 Marks)

**Module-5**

- 9 a. Explain non-disjunction as a proof of chromosomal theory. (10 Marks)  
b. Explain Color blindness with special reference to criss cross inheritance. (10 Marks)

OR

- 10 a. Explain the methods of sex determination in animals. (10 Marks)  
b. Define linkage and explain linkage maps with an example. (10 Marks)

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Important Note : 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.  
2. Any revealing of identification, appeal to evaluator and/or equations written eg, 42+8 = 50, will be treated as malpractice.