

2 0 2 3

(CBCS)

(4th Semester)

BOTANY

FOURTH PAPER

(Microbiology, Cytology, Genetics, Evolution)

Full Marks : 75

Time : 3 hours

The figures in the margin indicate full marks for the questions

(SECTION : A—OBJECTIVE)

(Marks : 10)

Tick (✓) the correct answer in the brackets provided :

1×10=10

1. The common word for bacterium which is straight rod in shape is

(a) coccus ()

(b) bacillus ()

(c) vibrio ()

(d) spirillum ()

2. The bacteria which have flagella all over its surface are called

- (a) atrichous ()
- (b) amphitrichous ()
- (c) lophotrichous ()
- (d) peritrichous ()

3. Which of the nitrogen fixer is involved in symbiotic association with leguminous plant forming root nodules?

- (a) *Azotobacter* ()
- (b) *Azomonas* ()
- (c) *Rhizobium* ()
- (d) *Clostridium* ()

4. Wine fermentation is produced by

- (a) *Lactobacillus* ()
- (b) *Saccharomyces* ()
- (c) *Aspergillus* ()
- (d) *Clostridium* ()

5. The sequence of cell cycle is

- (a) S, G₂, G₁ and M ()
- (b) S, M, G₁ and G₂ ()
- (c) G₁, S, G₂ and M ()
- (d) M, G₁, G₂ and S ()

6. The gene which masks the effect of another gene is called

- (a) epistatic gene ()
- (b) complementary gene ()
- (c) duplicate gene ()
- (d) lethal gene ()

7. Pairing of homologous chromosome takes place in

- (a) leptotene ()
- (b) zygotene ()
- (c) pachytene ()
- (d) diplotene ()

8. The system of sex determination in fish is

- (a) XX–XY type ()
- (b) XX–XO type ()
- (c) XY–XX type ()
- (d) XO–YO type ()

9. The theory of Natural Selection was proposed by

- (a) Mendel ()
- (b) Hugo de Vries ()
- (c) Lamarck ()
- (d) Charles Darwin ()

10. According to Darwin, the struggle for existence is caused by

- (a) over production ()
- (b) variation ()
- (c) natural selection ()
- (d) mutation ()

(SECTION : B—SHORT ANSWER)

(Marks : 15)

Write short notes on the following :

3×5=15

UNIT—I

1. Coccus

OR

2. Lysogenic cycle

UNIT—II

3. Antibiotics

OR

4. Microbes in water

UNIT—III

5. Lethal genes

OR

6. Duplicate genes

UNIT—IV

7. XX–XY method of sex determination

OR

8. Linkage map

UNIT—V

9. Organic evolution

OR

10. Survival of the fittest

(SECTION : C—DESCRIPTIVE)

(Marks : 50)

Answer the following questions :

10×5=50

UNIT—I

1. Describe the nutritional classification of bacteria.

10

OR

2. Write short notes on the following :

5+5=10

(a) Bacteriophage

(b) Transduction

UNIT—II

3. Describe with suitable diagram, the role of microbes in carbon cycle.

10

OR

4. Briefly describe the following :

5+5=10

(a) Fermented food

(b) Biofertilizers

UNIT—III

5. What are Mendel's laws of inheritance? Explain how these laws can be deduced from his experiments.

3+7=10

OR

6. Briefly describe the following :

5+5=10

(a) Incomplete dominance

(b) Interphase

UNIT—IV

7. What is meiosis? Describe the different stages of meiosis. 2+8=10

OR

8. Briefly describe the following : 5+5=10

(a) Chiasma and crossing over

(b) Importance of linkage

UNIT—V

9. Describe the theory of inheritance of acquired character. 10

OR

10. Give an account of the theory of evolution proposed by Hugo de Vries. 10
