

**IMMUNOLOGY**

Under CBCS – Credit 4

Time: 3 Hours

Max. Marks: 75

**SECTION – A****Answer ALL Questions :****(10 × 2 = 20)**

1. What is an adjuvant?
2. Differentiate epitope from paratope.
3. Mention the role of T cell subsets.
4. Classify the hypersensitivity reactions.
5. Point out the role of immune suppressive drugs.
6. Which immune therapy is practised for tumour treatment?
7. What is inflammation?
8. Mention the role of B cells in helminth infection.
9. Explain the principle involved in immune diffusion.
10. How does VDRL slide test used in the diagnosis?

**SECTION – B****Answer ALL Questions :****(5 × 5 = 25)**

11. a) Describe the basic structure of IgM.

**(OR)**

- b) Discuss the theory of germline rearrangement.

12. a) Trace out the classical pathway.

**(OR)**

- b) Compare and contrast primary and secondary immune responses.

13. a) How are autoimmune diseases treated?

**(OR)**

- b) Comment on the immunological basis of graft rejection.

14. a) How is the host defence mechanism evaded by the bacteria?

**(OR)**

- b) Illustrate the effector function of NK cells during protozoan infection.

15. a) Demonstrate the ELISA test.

**(OR)**

- b) How will you carryout RIA of insulin.

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

16. Give an account of diverse antibodies production.
17. Briefly describe the class switching mechanism.
18. Discuss the various viral strategies of immune evasion.
19. Illustrate the bone marrow and kidney transplantation methods.
20. Compare and contrast immune diffusion and immune electrophoresis methods.



**BIostatistics**

Under CBCS – Credit 4

Time: **3** HoursMax. Marks: **75****SECTION – A****Answer ALL Questions :****(10 × 2 = 20)**

1. Median.
2. Skewness.
3. Cluster Sampling.
4. Null Hypothesis.
5. Partial Correlation.
6. Regression Constants.
7. F – Value.
8. Variance.
9. Mortality.
10. Demographic characters.

**SECTION – B****Answer ALL Questions :****(5 × 5 = 25)**

11. a) Explain Chi-Square test. Add a note on its applications in genetic experiment.

**(OR)**

- b) Comment on Normal Distribution.

12. a) Distinguish Random and Non-Random Sampling.

(OR)

b) Explain the method and purpose of calculating Standard Error.

13. a) Describe the graphical method of expressing regression.

(OR)

b) How do you test the significance of regression?

14. a) Explain two way ANOVA using suitable example.

(OR)

b) Comment on F-distribution and its applications.

15. a) Briefly explain about Vital Statistics.

(OR)

b) Discuss the method to depict Life expectancy.

### SECTION – C

**Answer any THREE Questions :**

**(3 × 10 = 30)**

16. Calculate Mean, Median and Standard deviation for the following data

Height (Cm)	58	60	61	62	63	64	65	66	68	70
Plants (No.)	4	6	5	10	20	22	24	6	2	1

17. Explain the steps involved in t-test to compare mean.

18. Marks obtained by 5 students in algebra and trigonometry are given below. Calculate the Pearson Correlation Coefficient for the marks.

Algebra	15	16	12	10	8
Trigonometry	18	11	10	20	17

19. Certain manure was used on four plots of land A, B, C and D. Four beds were prepared in each plot and the manure used. The output of the crop in the beds of plots A, B, C and D is given below. Carry out the analysis of Variance and Comment

A	B	C	D
6	15	9	8
8	10	3	12
10	4	7	1
8	7	1	3

20. Give an account on demographic data of India.



**DEVELOPMENTAL BIOLOGY**

Under CBCS – Credit 4

Time: **3** HoursMax. Marks: **75****SECTION – A****Answer ALL Questions :****(10 × 2 = 20)**

1. Give the role of Sertoli cells.
2. What is cortical reaction?
3. What is Placenta?
4. What is Teratogenesis?
5. Define Competence.
6. What is Xenoplastic transplantation?
7. Explain Chemodifferentiation.
8. Reveal the Speciality of Stem Cells.
9. Bring the role of Thyroxine.
10. What is Blastema?

**SECTION – B****Answer ALL Questions :****(5 × 5 = 25)**

11. a) Explain the process of Spermiogenesis.

**(OR)**

- b) Bring out the molecular process of egg activation.

12. a) Describe the events of menstrual cycle.

**(OR)**

- b) Give a short account on cleavage of a mammalian egg.

13. a) Explain shortly the types of Induction.

**(OR)**

- b) Discuss the essence of gradient theory.

14. a) Enumerate the role of cytoplasm on differentiation.

**(OR)**

- b) Bring out the importance of stem cells.

15. a) Explain the mechanism of Regeneration.

**(OR)**

- b) What do you understand by dedifferentiation?

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

16. Write an essay on Parthenogenetic development in Invertebrates.
17. Illustrate the importance and the role of Placenta in gestation.
18. Explain the role of an organizer in the development of an embryo.
19. How does development occur by gene action and Hormonal control?
20. Bring out the events of Amphibian metamorphosis.



**EVOLUTION**

Under CBCS – Credit 5

Time: 3 Hours

Max. Marks: 75

**SECTION – A****Answer ALL Questions :****(10 × 2 = 20)**

1. What do you mean by Intraspecific struggle?
2. What is Industrial melanism?
3. DNA Phylogeny.
4. Amino acid substitution.
5. How did Mayer define a species?
6. Pre-adaptation.
7. Define Bradytely.
8. What do you understand by the term Altruism?
9. What does an isolating mechanism mean?
10. What does selfish gene refer to?

**SECTION – B****Answer ALL Questions :****(5 × 5 = 25)**

11. a) What do you mean by Genetic drift? Explain with an example.

**(OR)**

- b) Explain the modes and types of selection.

12. a) How do you analyse genetic variation by Electrophoresis?

**(OR)**

- b) Write an account on Molecular clock of Evolution.

13. a) Discuss Quantum speciation and its effects as an Evolutionary Event.

**(OR)**

- b) Describe the Nature of Speciation.

14. a) Give an account on Simpson's adaptive grid.

**(OR)**

- b) What do you understand by punctuated equilibria?

15. a) Explain the prospects of Eugenics.

**(OR)**

- b) Bring out the importance of Kin Selection.

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

16. Explain Darwinian principles.
17. How does protein evolution occur?
18. Bring out the role of Isolating mechanisms in Evolution.
19. How did the ancient animals extinct? Explain the causes.
20. Write an essay on Human Evolution.



**APPLIED BIOTECHNOLOGY**

Under CBCS – Credit 5

Time: 3 Hours

Max. Marks: 75

**SECTION – A****Answer ALL Questions :****(10 × 2 = 20)**

1. Gene therapy.
2. Drug targeting.
3. YAC.
4. Retroviral vector.
5. GM Food.
6. Bt gene.
7. Nanoparticle.
8. Drug designing.
9. Biomining.
10. Biogas.

**SECTION – B****Answer ALL Questions :****(5 × 5 = 25)**

11. a) How are various factors used as drug targets?

**(OR)**

- b) List out the applications of various biomaterials.

12. a) Demonstrate the microinjection method.

**(OR)**

- b) Illustrate the artificial insemination.

13. a) How is germplasm stored?

**(OR)**

- b) GM Food is a boon or bane – Justify.

14. a) Discuss the chemical strategy of nanoparticle synthesis.

**(OR)**

- b) Describe the characteristics of nanoparticles.

15. a) Explain the modern sewage treatment methods.

**(OR)**

- b) How is oil recovered?

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

16. Give an account of molecular analysis of human diseases.
17. Discuss the embryonic stem cell engineering in detail.
18. Write about tissue culture techniques.
19. How are nanoparticles used in drug designing?
20. Comment on the methods of biodiesel and biogas production.



**ENVIRONMENTAL BIOLOGY**

Under CBCS – Credit 5

Time: 3 Hours

Max. Marks: 75

**SECTION – A****Answer ALL Questions :****(10 × 2 = 20)**

1. Food chain.
2. Ecological succession.
3. Rainwater harvesting.
4. Soil erosion.
5. Radio activity.
6. Half-life period.
7. Population explosion.
8. Population control.
9. Role of PCB.
10. Flood.

**SECTION – B****Answer ALL Questions :****(5 × 5 = 25)**

11. a) Explain briefly the ecological pyramids.

**(OR)**

- b) Briefly describe the methods of biodiversity conservation.

12. a) Give a brief account on the forest conservation.

**(OR)**

- b) Write a brief account on the origin and kinds of monsoon.

13. a) Write notes on the sources of toxicants.

**(OR)**

- b) Explain briefly the biological effects of nuclear radiation.

14. a) Explain briefly the characteristics of urban environment.

**(OR)**

- b) Give a brief account on the life supporting system of space.

15. a) Analyze briefly the effects of any two natural calamities on human life.

**(OR)**

- b) Discuss briefly the principles of environmental education.

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

16. Write in detail the various components of an ecosystem.
17. Explain in detail the impact of civilization on sustainable development.
18. Give a detailed account on the safety and hazards of the nuclear power plants.
19. Describe in detail the impact of transport on urban environment.
20. Write an essay on the UNESCO program of man and biosphere (MAB).



**SECTION – A****Answer ALL Questions :****(10 × 2 = 20)**

1. Vermicomposting.
2. Organic farming.
3. Honey comb and bee hive.
4. Apiary.
5. Morigulture.
6. Grainage technology.
7. Edible fishes.
8. Induced spawning.
9. Native breeds.
10. Ranikhet disease.

**SECTION – B****Answer ALL Questions :****(5 × 5 = 25)**

11. a) Describe the characteristics and application of vermicasts.

**(OR)**

- b) Explain the preparation of vermiwash and its applications.

12. a) Comment on the different races of honey bees.

**(OR)**

- b) Analyze the various value added products of honey.

13. a) Explain the basic methods of propagation of mulberry.

**(OR)**

- b) Write an account on non-mulberry silkworms.

14. a) Enumerate the characteristics of cultivable fishes.

**(OR)**

- b) Give an account on ornamental fish culture.

15. a) Give an account on the common dairy products.

**(OR)**

- b) Explain the housing and feeding of poultry birds.

**SECTION – C****Answer any THREE Questions :****(3 × 10 = 30)**

16. Discuss the role of vermitechnolgy in organic farming.
17. Analyze the nutritive and medicinal values of honey.
18. Describe the life stages and life cycle of the mulberry silkworm.
19. Explain the technique of induced spawning in fishes.
20. Write an account on the characteristics and types of dairy breeds.

