



VIVEKANANDA COLLEGE, TIRUVEDAKAM WEST

(Autonomous & Residential)

[Affiliated to Madurai Kamaraj University]

M.Sc. Zoology Degree (Semester) Examinations, April 2020

Part – III : Core Subject : Second Semester : Paper – I

IMMUNOLOGY

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(5 × 1 = 5)

1. The substance inducing a specific immune response____
 a) Antigen b) Antibody c) Immunogen d) Epitope
2. What is the role of complement system?
 a) Cytolysis b) Opsonisation c) Anaphylotoxin d) all the above
3. Tentative cells identify tumor cells with ____ on their surface.
 a) CD34 b) CD8 c) MHC class 2 d) CD4
4. The phagocytic cells that generates acute inflammation an
 a) Neutrophils b) Basophils c) Eosinophils d) Monocytes
5. The maximum rate of precipitation occurs in
 a) zone of antigen excess b) Zone of equivalence
 c) Zone of antibody excess d) all the above

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

6. What are adjuvants?
7. What are the biological properties of immunoglobulin G?
8. Explain cytotoxic T cells.
9. Differentiate humoral and cell mediated immunity.
10. Give an account on epitopes.
11. Describe the effector function of NK cells.
12. What is ELISA?

SECTION – C

Answer ALL Questions : (5 × 6 = 30)

13. a). Describe the structure of an antigen.
[OR]
b). Explain immunoglobulin E
14. a). Give an account on primary and secondary immune response.
[OR]
b). Write a detailed account on antibody mediated hypersensitivity reaction. (Type II)
15. a). Describe class switching mechanism.
[OR]
b). Give a brief account on isotype, allotype and idiotype domains of Ig classes.

16. a). Describe viral strategies of immune evasion.

[OR]

- b). Explain the role of B cells in helminth infection.
17. a). Describe the bacterial evasion of host defense mechanism.

[OR]

- b). Write a brief account on the radial immuno diffusion.

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

18. What is immunoglobulin? Describe immunoglobulin classes, their properties and functions.
19. Describe IgE mediated hypersensitivity reaction (type I)
20. Write an essay on cell mediated immune response.
21. Give a detailed account on immune response against protozoan parasites.
22. Write a detailed account on Immuno electrophoresis with suitable diagram.

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M.Sc. Zoology Degree (Semester) Examinations, April 2020

Part – III : Core Subject : Second Semester : Paper – II

BIO-STATISTICS

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(5 × 1 = 5)

1. In chronological classification, data are classified on the basis of
 - a) Geographical area
 - b. Quality
 - c. Time of occurrence
 - d. Class interval
2. Sampling errors are present only in
 - a) Sample survey
 - b. Census survey
 - c. Both a and b
 - d. Bias
3. A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called:
 - a Correlation
 - b. Regression
 - c. Residual
 - d. Slope
4. The error deviations within the SSE statistic measure distances:
 - a. within groups
 - b. between groups
 - c. both (a) and (b)
 - d. between each value and the grand mean
5. The crude and standard rates are used in _____ rate
 - a. birth
 - b. death
 - c. fertility
 - d. crude birth

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

6. Explain standard deviation.
7. List out the parts of a table.
8. What is sampling?
9. Illustrate the scatter diagram.
10. Distinguish the objectives of correlation and regression.
11. What is degrees of freedom?
12. Define skewness.

SECTION – C

Answer ALL Questions :

(5 × 6 = 30)

13. a). Demonstrate the organization of a statistical table.

[OR]

- b). Utilize the following data for the calculation of median.

Percentage of Marks	No. of Students
0 – 10	25
10 – 20	35
20 – 30	46
30 – 40	33
40 – 50	21

14. a). Organize the procedure for the calculation of Student's "t" test.

[OR]

- b). Distinguish the characteristics of various sampling methods.

15. a). Explain the methods of regression with examples.

[OR]

- b). A random sample of 5 school students was selected and their marks in Maths and Science are found to be:

	1	2	3	4	5
Maths	82	65	71	43	89
Science	90	73	68	52	77

Calculate Spearman's rank correlation coefficient.

16. a). Analyze the applications of 'F' distribution.

[OR]

- b). Explain addition and multiplication theorems of probability.

17. a). Define data. Explain its types.

[OR]

- b). Describe the classification of data with illustrations.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

18. Calculate the standard deviation for the following data:

Age group	Frequency
0 – 10	12
11 – 20	20
21 – 30	33
31 – 40	46
41 – 50	59
51 – 60	41
61 – 70	34
71 – 80	22
81 – 90	13
91 – 100	8

19. List out the procedure of hypothesis testing.

20. The following table gives the values for age (X) and systolic blood pressure (Y) for 10 women. Find out the Pearson's correlation coefficient.

Age (years)	42	46	42	71	80	74	70	80	85	70
Systolic blood pressure (mmHg)	130	116	148	100	156	162	152	156	162	158

21. The following data represent the gain in weight (in kg) of a fish cultured in 4 diet formulations (D1, D2, D3 and D4) for a period of 3 months. Analyze these data for significant difference among the diet formulations in terms of gain in weight.

D1	D2	D3	D4
6	9	7	3
7	5	9	6
3	8	10	3
5	8	8	5
4	9	11	3

22. Write an essay on diagrammatic presentation of data.

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M.Sc. Zoology Degree (Semester) Examinations, April 2020

Part – III : Core Subject : Second Semester : Paper – III

DEVELOPMENTAL OF BIOLOGY

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(5 × 1 = 5)

1. One of the minute cell which separates form the animal egg during maturation is known as
 - a) Primary spermatogonia
 - b) Secondary oogonia
 - c) Primary oogonia
 - d) Polar body
2. The type of placenta found in human being is
 - a) Diffuse
 - b) Zonary
 - c) Cotyledonary
 - d) Discoid
3. The time of neural induction experiments conducted by____
 - a) Yamada
 - b) Reveberi
 - c) Waddington
 - d) Saxen & Toivonen
4. Gene amplification occurs in the oocytes of _____
 - a) Fishes
 - b) Insects
 - c) Amphibians
 - d) Birds
5. The adult frog is
 - a) Ammonotelic
 - b) Ureotelic
 - c) Uricotelic
 - d) Aminotelic

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

6. Define competence
7. What is sertoli cells?
8. Define teratogenesis.
9. Why *Xenopus* is a good model organism for developmental biology?
10. Classify the stem cells.
11. What is meant by retrogressive metamorphosis?
12. "Blastema is composed of undifferentiated pluripotent cells"- Discuss.

SECTION – C

Answer ALL Questions :

(5 × 6 = 30)

13. a). Examine the molecular basis of egg activation during fertilization.

[OR]

- b). Classify the types of eggs.

14. a). Highlights the characteristics of malignancy.

[OR]

- b). Comment on the menstruous cycle.

15. a). Explain the various cleavage patterns of eggs.

[OR]

- b). Give an account on types of induction.

16. a). Write notes on types of differentiation.

[OR]

- b). Examine the role of cytoplasm on differentiation.

17. a). Describe the mechanism of regeneration process.

[OR]

- b). Briefly describe the hormonal control of metamorphosis in amphibian.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

18. Write an essay on Oogenesis

19. Give an account on extra embryonic membranes of the human embryo.

20. Write an essay on natural parthenogenesis.

21. "Stem cells are boon to medical research" – Analyse.

22. Write an account on metamorphosis in Amphibian.

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M.Sc. Zoology Degree (Semester) Examinations, April 2020

Part – III : Elective Subject : Second Semester : Paper – I

EVOLUTION

Under CBCS – Credit 5

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(5 × 1 = 5)

1. What is the difference between natural selection and sexual selection?
 - a. Sexual selection occurs during sex.
 - b. Natural selection is a type of sexual selection.
 - c. Sexual selection is a type of natural selection.
 - d. Sexual selection occurs within demes, natural selection does not.
2. Pick out the technique that is used recently to demonstrate evolutionary process

a. Test tube evolution	b. Fossils evolution
c. Hybridization	d. Electroporation
3. In same geographical region, if new species evolve from a single ancestral species the speciation is known as

a. Sympatric speciation	b. Allopatric speciation
c. Parapatric speciation	d. Speciation
4. The process of evolutionary adjustment to a newly occupied adaptive zone can be called

a. Preadaptation	b. Postadaptation	c. Allometry	d. Neoteny
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**APPLIED BIOTECHNOLOGY**

Under CBCS – Credit 4

Time: **3** HoursMax. Marks: **75****SECTION – A****Answer ALL Questions :****(5 × 1 = 5)**

1. ____ is the permanent solution for genetic disease
 - a. Gene therapy
 - b. SCID
 - c. Dystrophin
 - d. All the above
2. _____ are used to carry human β -globin gene complex and produce transgenic mice
 - a. YACs
 - b. Gene library
 - c. cDNA
 - d. Termination codon
3. The insecticidal properties of rotenones was first detected by
 - a. Indians
 - b. Chinese
 - c. Japanese
 - d. Germans
4. Which of the following is the application of nanotechnology to food science and technology?
 - a. Agriculture
 - b. Food safety and biosecurity
 - c. Product development
 - d. All of these
5. How much fraction of total solar energy reaching earth is converted into biomass?
 - a. 2.0%
 - b. 0.2%
 - c. 0.02%
 - d. 1%

SECTION – B

Answer any FIVE Questions : (5 × 2 = 10)

6. Summarize the role of HGPRT.
7. What is transgenesis.
8. Compare the advantages of Microinjection and Electroporation methods.
9. Explain the mechanism of BT toxin.
10. How the GM foods are extended?
11. Classify the two methods of Nano particle synthesis.
12. Interpret the principle of bioremediation.

SECTION – C

Answer ALL Questions : (5 × 6 = 30)

13. a) How to choose biomaterials for Tissue engineering?
[OR]
b) Development of Monoclonal Antibodies – Explain
14. a) What are the methods are applied for Artificial Insemination?
[OR]
b) Construct the retro viral vector for gene transfer
15. a) Comment on cystic fibrosis and sickle cell anemia.
[OR]
b) Write an account on the role of Bacillus thuringiensis in Agriculture.

16. a) What will the outcome product, if the Silver nitrate experimented with Plant sample?

[OR]

- b) Discuss briefly the role and significance of super bug.

17. a) Give a short note on application of Nano techniques in medicine.

[OR]

- b) What are the steps involved in biomining process?

SECTION – D

Answer any THREE Questions : (3 × 10 = 30)

18. Give an account on embryonic stem cell engineering.
19. List out the gene transfer methods.
20. How to protect the plant from pests using Genetic engineering?
21. Write an essay on method and process are involved in the production of Biogas.
22. Write a detailed account on the treatment of sewage and its significance.

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M.Sc. Zoology Degree (Semester) Examinations, April 2020

Part – III : Core Subject : Fourth Semester : Paper – II

ENVIRONMENTAL BIOLOGY

Under CBCS – Credit 4

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(5 × 1 = 5)

1. The place where an organism lives is called
 - a. Habit
 - b. Habitat
 - c. Biome
 - d. Ecosystem
2. The natural resources that have short recycling time and reappear soon is
 - a. Non-renewable
 - b. renewable
 - c. Exhaustible renewable
 - d. Exhaustible non renewable
3. The major source of natural emission of toxicants from wetland produced during biological decay is
 - a. CO₂
 - b. Sulphur gases
 - c. Nitrogen gases
 - d. Ozone
4. _____ is conducted almost in all countries once in 10 years.
 - a. Population census
 - b. Registration method
 - c. Analytical method
 - d. All the above
5. _____ is the study of the technical processes which are used to minimize the population.
 - a. Environmental Science
 - b. Environmental engineering
 - c. Environmental education
 - d. All the above

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

6. Define Bioindicators?
7. Explain insitu & exsitu conservation?
8. What are the main sources of acid rain formation?
9. Define the half-life period?
10. Write short notes on organic & inorganic toxins?
11. Define population density?
12. Define endangered species.

SECTION – C

Answer ALL Questions :

(5 × 6 = 30)

13. a). What do you understand by community? Discuss its structure, stratification and periodicity?

[OR]

- b). Give a brief account on documentation of biodiversity.

14. a). What are the types of natural resources? Explain in detail the conservation of any two of renewable natural resources?

[OR]

- b). Write a brief notes on Rain water Harvesting?

15. a). Difference between toxicants, toxins and poisons?

[OR]

- b). Explain the biological effect of nuclear radiations?

16. a). Describe the factors that play key role in population regulation?

[OR]

- b). Give an account on characterization on urban environment?

17. a). Explain the goals and objectives of environmental education.

[OR]

- b). Explain in detail the MAB.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

18. What is remote sensing? How remote sensing help in ecological studies?

19. Describe non-conventional sources of energy?

20. Give a detailed account on classification of toxicants?

21. Explain the detailed account of population?

22. Write a brief account on environmental education in india.

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Part – III : Elective Subject : Fourth Semester : Paper – I

BIO-FARMING TECHNOLOGY

Under CBCS – Credit 5

Time: **3** Hours

Max. Marks: **75**

SECTION – A

Answer ALL Questions :

(5 × 1 = 5)

1. The percentage of nitrogen in earthworm casting is
 - a. 3%
 - b. 2%
 - c. 1%
 - d. 4%
2. Life span of Queen is_____.
 - a. Two to four weeks
 - b. Twelve to Sixteen weeks
 - c. Seven to nine weeks
 - d. Three to seven years
3. Pebrin is caused by:
 - a. Tricholyga sorbillans
 - b. Bacillus megatherium
 - c. Spicaria prasina
 - d. Nosema bombycis
4. Induced breeding is effective in which of them?
 - a. Pisciculture
 - b. Sericulture
 - c. Apiculture
 - d. Lac culture
5. The calorific value of one gram of fat is
 - a. 4
 - b. 5
 - c. 9
 - d. 10

SECTION – B

Answer any FIVE Questions :

(5 × 2 = 10)

6. Comment on vermitechnology.
7. List out the application of vermiwash.
8. Comment on *Apis dorsata*.
9. Define Moriculture.
10. Compare sericulture and apiculture.
11. Write the characteristics of cultural fishes.
12. What is artificial in semination?

SECTION – C

Answer ALL Questions :

(5 × 6 = 30)

13. a) Discuss the role of vermicompost in organic farming.

[OR]

- b) Explain the biology of *Eisenia foetida*.

14. a) Comment on bee diseases

[OR]

- b) Explain the life cycle of honey bee.

15. a) Write an account on rearing appliances used in sericulture.

[OR]

- b) Describe the life cycle of silkworm.

16. a) Explain the principle of hypophysation technique.

[OR]

- b) Discuss the morphological features of Indian major carps.

17. a) Explain physico chemical properties of milk.

[OR]

- b) Describe the symptoms and control measures of Ranikhet diseases.

SECTION – D

Answer any THREE Questions :

(3 × 10 = 30)

18. List out the Steps of Vermiwash production and preparation process.

19. Distinguish between indigenous and Modern method of **honey**

Production.

20. Describe the methods of induced breeding technique.

21. Write an essay on setting aquarium.

22. Explain the characteristics of exotic dairy breeds.

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