

M.Sc. II General Science Semester-IV Examination
Zoology
Paper: Animal Cells in Biotechnology (MZT401)
Question Bank

Q. 1: Define / One line answers.

1. Define tissue culture
2. What is the function of co₂ incubator?
3. What is media?
4. Define Karyotyping.
5. What is chromosome painting?
6. What is heterotypic cell fusion? Give one example.
7. What is sterilization?
8. What is monolayer cell culture?
9. Define stem cell.
10. What is FISH technique? Give its significance.
11. What is PEG? Give its significance.
12. What is homotypic cell fusion? Give one example.
13. What is phenol Red?
14. What is serum independent defined media?
15. Define stem cell.
16. What is Cell Viability
17. What is ideogram?
18. What is E-fusion of cells?

Q.2 Long answer questions. (6 Marks)

1. Write note on Laminar flow hood.
2. Write note on Maintenance of cell culture.
3. Write in detail on Primary cell culture.
4. Describe Polyethylene glycol mediated cell fusion in detail.
5. What is MTT assay? Describe in detail.
6. What is Invitro fertilization (IVF) technique? Describe the steps involved in IVF.
7. Write note on Basic aseptic techniques.
8. Describe in detail Serum dependant defined media.
9. Describe equipment in tissue culture lab and its uses.
10. Describe Sendai virus mediated cell fusion in detail.
11. What is cell toxicity? Explain it with trypan blue dye exclusion method.
12. Write note on Cryopreservation

13. Write in detail on Isolation and separation of cell
14. Write Methods of isolation and separation of cell.
15. Describe E-fusion of cells in detail.
16. Describe hybridoma cell preparation. Add a note on their properties.
17. What is Invitro fertilization (IVF) technique? Describe the steps involved in IVF.

Q.5 Short Notes/ attempt the following (4 marks)

1. Write a note on microscope.
2. Write in detail about transformed cell line.
3. Write the advantages of stock culture.
4. Write a note on FISH technique.
5. Write a note on MEM
6. Write a note on Viable Cell count.
7. Write a note of E-fusion of cells.
8. Write the advantages of stock culture.
9. What Write a note on suspension culture.
10. Which glassware used in tissue culture lab?
11. What are the advantages of tissue culture?
12. Write a note on Antibiotic free stock culture
13. Write a note on Karyotyping.
14. What are the contents of Basal Salt Solution (BSS)
15. How to maintain cell culture?
16. Write a note on Sendai virus.
17. Write a note on Sendai virus.
18. Write a note on suspension culture.
19. What are the uses of refrigerator and freezers.
20. Write a note on suspension culture.
21. write a note on clonal culture.
22. Write a note on cytotoxicity.
23. Give details on nutritional requirement of cells natural media.
24. Write a note on Physical requirement of cell culture.
25. Write a note on Sendai virus.
26. Write a note on Write a note on Karyotyping.
27. Write a note on FISH technique.

M.Sc. II General Science Semester-IV Examination, _____
Zoology
Paper: Animal Cells in Biotechnology (MZT401)
Subject Code: 94113

Q. 1: Answer the following questions. [2X6=12]

- Define tissue culture. (Definition- 2 marks)
- What is the function of CO₂ incubator? (any 2 Functions- 2 marks)
- What is media? (Definition- 2 marks)
- Define Karyotyping. (Definition- 2 marks)
- What is chromosome painting? (Definition- 2 marks)
- What is heterotypic cell fusion? Give one example. (Definition- 1 marks and example 1 mark)

Q.2 Attempt the following questions. [6+6]

- Write note on Laminar flow hood. (Any 6 points)
- Write note on Maintenance of cell culture. (Any 6 points)

Q.3 Attempt the following questions. [6+6]

- write in detail on Primary cell culture.

Ans: Definition 01 marks

Steps 02 marks

Explanation 04 marks

- Describe Polyethylene glycol mediated cell fusion in detail. (Procedure explanation)

Q.4 Attempt the following questions. [6+6]

- What is MTT assay? Describe in detail. (Def- 2 marks, Description-4 marks)
- What is In vitro fertilization (IVF) technique? Describe the steps involved in IVF. (Def- 2 marks, Steps-4 marks)

Q.5 Attempt the following questions. [4+4+4]

- Write a note on microscope. (Description-4 marks)
- Write in detail about transformed cell line. (Description-4 marks)
- Write the advantages of stock culture. (Any 4 advantages)

Q.6 Attempt the following questions. [4+4+4]

- Write a note on FISH technique. (Description-4 marks)
- Write a note on MEM (Description-4 marks)
- Write a note on Viable Cell count. (Description-4 marks)

Q.7 Attempt the following questions. [4+4+4]

- Write a note of E-fusion of cells. (Description-4 marks)
- Write the advantages of stock culture. (Any 4 advantages)

c) Write a note on suspension culture. (Description-4 marks)

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Zoology
M.Sc. II (Semester IV),
Toxicology & Immunology (MZT 402)

One Sentence answer [2 mark]

1. Which cells are involved in cell mediated immunity and humoral immunity?
2. What is forensic toxicology?
3. Define LC50 and LD50
4. Define bio magnification with example
5. What are the applications of Radioimmunoassay in immunology?
6. What is Human Leucocyte Antigen (HLA)?
7. Define poison with example
8. Give the four names of organophosphates pesticides.
9. Define immunity and state types of immunity.
10. What are the classes of immunoglobulin?
11. Define an epitope
12. What is antigen?
13. What are the groups of the neurotics?
14. Enlist the four toxic effects of pyrethroids pesticides
15. Define food additive and state the types.
16. Define immunoglobulin
17. What are the factors causing hypersensitivity?
18. State two properties of tumor cells
19. Define Toxicants
20. What is sub acute toxicity test
21. Give the names of most common food additives
22. Define phagocytosis.
23. Enlist the names of attenuated live vaccines.
24. What is MHC?
25. Enlist the factors involved in tumor immunity.
26. Type IV of hypersensitivity is also called as?
27. What is the long form of ELISA?
28. Define an epitope?
29. What is alternative name of innate immunity?
30. What are antigens?
31. What is immunogenic tolerance?
32. Which cells are involved in humoral immunity?
33. Which cells are involved in cell mediated immunity?
34. Define types of epitope.

35. Define causes of cancer cell formation

Long answer Question [6 marks]

1. Explain in detail behavioural toxicological testing methods.
2. Define tumor. Explain immune response to tumor.
3. What is insecticides? Describe in detail mode of action of organochlorine and organophosphate insecticides.
4. What is hypersensitivity? Describe anaphylactic hypersensitive (Type I).
5. What are the scope and importance of toxicology? State principal aspects of toxicology.
6. What is immunoglobulin? Enlist the classes, properties and functions of immunoglobulin.
7. What is Food additives? Explain different types of intentional food additives.
8. Describe anatomical barriers of innate immunity.
9. Describe behavioural toxicity testing methods.
10. What is phagocytosis? Explain the process of phagocytosis.
11. What is the pesticide? Give brief account of classification of pesticides.
12. What is vaccine? Explain attenuated and vaccine prepared with killed microorganism.
13. Describe T cell mediated cytotoxicity
14. Define toxicology. Explain different disciplines of toxicology.
15. What is hypersensitivity? Describe in detail types of hypersensitivity based on time taken for reaction.
16. What is toxicity tests? Describe acute toxicity test.
17. What is MHC? Describe functions of MHC.
18. What is biotransformation? Explain the process of biotransformation
19. Describe anatomical barriers of innate immunity.
20. Describe the anatomical and phagocytic barriers of innate immunity.
21. What is hypersensitivity? Describe in detail type I hypersensitivity.
22. Define vaccination. Describe nature of vaccines.
23. Describe process of Phagocytosis
24. Describe T cell mediated cytotoxicity
25. What is mean by vaccine? Describe types of vaccines.
26. What is Subacute toxicity? Describe its objectives and design
27. Describe in detail types of Antibodies.
28. Describe in detail antigenicity and immunogenicity and factors influencing immunogenicity.
29. Describe in detail MHC and its classes
30. Describe heavy metal poisoning.
31. Describe in detail carbamate insecticide poisoning
32. Describe Biomagnification process of toxicant in trophic level.

Short answer Question [4 marks]

1. Recombinant Vaccine

2. Write short note on Environmental toxicology
3. Write a note on vaccine prepared with killed microorganism
4. Write short note on Intentional food additives
5. Describe Experimental Design for chronic toxicity test
6. Write short note on toxic effect of Arsenic
7. Write short note on phagocytosis
8. Describe classification of pesticides on the basis of mode of action and effect type
9. Describe Factors causing hypersensitivity and common hyper sensitivity reactions
10. Write short note on Macrophages
11. Write note on Monoclonal antibodies
12. Write the classification of toxicants
13. What are the toxic effect of Organochlorine insecticides?
14. Describe Properties and functions of immunoglobulin
15. Describe Immunotherapy of tumors
16. Write short note on Acquires immunity
17. Write a note on Scope and importance of toxicology
18. Write a note on toxicity of Mercury
19. Write a note on functions of Major histocompatibility complex
20. Describe categories of toxic effects
21. Draw a labelled diagram of fate of pesticide in the environment
22. Write short note on innate immunity
23. Describe Toxicity of cadmium
24. Write short note on Radioimmunoassay
25. Write short note on Tumor antigen
26. What are the toxic effect of Organophosphate insecticides?
27. Describe functional toxicological testing methods.
28. What is tumor immunology? State the causes of tumor
29. Functional toxicity tests
30. Experimental Design for acute toxicity test
31. Behavioural toxicity tests
32. Toxic effect of Organophosphate insecticides.
33. Write a note on Pyrethroids
34. Process of bioaccumulation
35. Accidental food additives
36. Vaccine prepared with killed microorganism
37. Immunoglobulin G
38. types of hypersensitivity
39. Delayed hypersensitivity
40. Describe the causes of tumor
41. Immunotherapy of tumors
42. ELISA
43. Carbamate Poisoning
44. Write a note on toxicity of lead

45. Write a note on toxicity of Arsenic
46. Write a note on Attenuated vaccine
47. Write a note on IgM
48. Write a note on Epitopes
49. Describe Factors influencing immunogenicity
50. Write a note on Cytokines
51. Write a note on Immunoglobulin structure
52. Write a note on MHC Class I
53. Write a note on MHC Class II
54. Write a note on T cell
55. Write a note on B cell antigenic properties.
56. Describe types of toxicants based on effects on organs.
57. Describe bio magnification of toxicants.
58. Write a note on analytical toxicity tests.
59. Write a note on LC50 and LD50.
60. Explain how to calculate LC50 by probit analysis.
61. Systemic effects of toxicants

M.Sc. II Semester IV, Examination
Subject: Zoology
Cell Differentiation and Development & specialization
Question Bank

Q.1: Define following Terms/ Answer in One Sentence (2 Marks)

- 1) Where is the location of photoreceptor cells of eye?
- 2) What is the origin of pancreatic cells?
- 3) What is autonomous speciation.?
- 4) Define Neuron.
- 5) Enlist the types of pituitary cells.
- 6) What is the function of neurosecretory cells?
- 7) What is continuous speciation?
- 8) What is synapse?
- 9) What is the function of nervous system?
- 10) What is the function of ductal cells?
- 11) What is bone remodeling?
- 12) What is the location of cardiac muscles?
- 13) What is neurotransmitter?
- 14) Define organogenesis.
- 15) Which ions are essential for muscle contraction?
- 16) Define muscle contraction.
- 17) Define voltage gated channels.
- 18) Define ion gated channels.
- 19) What is Mitosis?
- 20) What is building block of nervous system?
- 21) What is pluripotent cell?
- 22) What is unipotent cell?

23) What is stem cells?

24) Define pattern formation.

25) Which elements are responsible for anterior axis formation?

Q2): Attempt the Following questions . (6 Marks)

1) What is differentiated state? Describe photoreceptor cells of retina in detail.

2) Write note on Genes involved in development and differentiation.

3) Describe Organogenesis with diagram.

4) Describe modulation and regeneration of skeletal muscles.

5) Describe in detail the process of pattern formation in animal body.

6) Describe Hepatoparenchymal cells and its functions in detail.

7) Write note on Renewal of cells by stem cell in formation of epithelial cells.

8) Describe in detail about cell movement and shaping of vertebrate body.

9) Describe in detail mechanism of animal development.

10) Describe the process Communication at synapses.

Q.3) Attempt the Following questions . (6 Marks)

1) What is voltage gated ion channel with diagram?

2) Write note on Mechanism of animal Organogenesis.

3) Describe in detail regeneration of Cardiac muscles.

4) Describe pituitary cells and its functions in detail.

5) Describe Pancreatic cells and its functions in detail.

6) Describe photoreceptor cells and its functions in detail.

7) Describe liver cells and its functions in detail.

8) Describe the process of blood cell formation.

9) Give account of connective tissue family.

10) Describe propagation of action potential with well labeled diagram.

Q.4) Attempt the Following questions . (6 Marks)

1) Write in detail on neuron and its types.

2) Describe the general body pattern formation in development of *Drosophila melanogaster*.

3) Describe the Genesis of body plan with diagram.

4) Describe in detail about dorsal and ventral body formation in animal

5) Describe osteoblast cells and its function in detail.

6) Describe the process of mitosis in detail with diagram.

7) Describe the process of meiosis in detail with diagram.

8) Describe the Process of reabsorption during remodeling of bone.

9) Describe the Process quiescent of in bone formation.

10) Describe the Process Mineralisation during remodeling of bone.

Q.5) Attempt the Following questions .

(4 Marks)

1) Draw a flow chart of development of liver.

2) Describe cell cycle with diagram.

3) Write Process of activation of pro osteoblast during remodeling of bone.

4) Write note on Muscle contraction.

5) Write note on Apoptosis in bone formation.

6) Write function of Islets of Langerhans.

7) Draw a well labeled diagram of Axis formation in fruit fly.

8) Write the role of hormones in Bone remodeling.

9) Write note on hormones secreted by Islets of langerhans.

10) State the difference between osteoblast and osteoclast cells.

11) Draw a flowchart of cell movement during appendages formation.

12) Write note on homeotic selector genes and its function.

13) Draw diagram of action potential with different ions involved in it.

14) Differentiate between Voltage gated channel and leaky ion channels.

15) Describe the functions of Corneal epithelial cells.

Q.6) Attempt the Following questions .

(4 Marks)

1) Write a note on Photoreceptor cells of retina.

2) Explain how polarity of Egg is determined in amphibians.

- 3) Describe imaginal disc with diagram.
- 4) Draw a well labeled diagram of smooth muscle.
- 5) Differentiate between voluntary and involuntary muscle.
- 6) Describe how Actin and myosin work during muscle contraction.
- 7) Write note on Early development of amphibians.
- 8) Draw a well labeled diagram of Blastula formation in organism.
- 9) Describe types of cleavages in various organism.
- 10) Draw a well labeled diagram of Neurosecretory cells.
- 11) Draw a diagram of retina of eye.
- 12) Draw a diagram of cells Skin epithelium.
- 13) Draw a flowchart of bone formation during early stage.
- 14) Describe the process of Gastrulation in detail.
- 15) State functions of pluripotent stem cells.

Q.7) Attempt the Following questions .

(4 Marks)

- 1) Write note on renewal of intestinal epithelium
- 2) Describe the cellular development of hepatoparenchymal cells.
- 3) Write note on Osteocytes .
- 4) Write note on fate map of *xenopus*.
- 5) Differentiate between Invagination and involution.
- 6) Write note on Neuro hormones.
- 7) Draw a flowchart of invagination during development.
- 8) Draw a diagram of involution .
- 9) Write note on Rotational cleavage.
- 10) Write note on Spiral cleavage.
- 11) Write note on Transplantation in late Gastrula.
- 12) Write note on Beta catenine.
- 13) Describe genesis of corneal endothelial cells.
- 14) Draw a well labeled diagram of T. S. of Pituitary gland.
- 15) Write note on hormones of Pituitary gland.

Subject: Zoology
M.Sc. II (Semester IV),
Cell pathology (MZT 404)
Question Bank

One sentence answer (2 marks)

1. Define Necrosis.
2. Define pyknosis
3. Define aging
4. What are oncogenes?
5. Which type of protein is not part of the apoptosome.
6. Define antigenic shift
7. Why the collagen protein is affected badly in old age?
8. Give the name of source of isolation of mitomycin.
9. What is gerontology? Who discover the word gerontology?
10. What type of mutation involve in conversion, of a proto-oncogene into an
11. oncogene?
12. Define apoptosis.
13. Which drug is used as first line drug for treating tuberculosis?
14. Define Invasiveness.
15. Enlist the antibiotic inhibiting RNA Synthesis.
16. Define Senescence.
17. Define benign tumors.
18. What is Cancer?
19. What happened in the brain in Alzheimer's disease?
20. What is ROS
21. How ROS form?
22. What is mean by wear and tear theory
23. What is hypertrophy?
24. Define hyperplasia.
25. Define atrophy of tissue.
26. Define proto-oncogenes
27. What are the types of cancer?
28. What is carcinoma?
29. Which antibiotics used for HIV
30. What is fat necrosis?

Long answer Question (6 Marks)

1. Describe different theories of aging.
2. Describe mechanism of action of mitomycin.
3. Describe replication cycle of poliovirus.
4. Describe how cultured cells can be transformed into tumor cells
5. Describe Oncogenic Mutations in Growth-Promoting Proteins
6. What is aging? Describe subcellular changes during aging. Add a note on maximum life span.
7. What is Apoptosis? Describe molecular mechanism of apoptosis
8. Describe the procedure of metastasis.
9. Describe how cultured cells can be transformed into tumor cells
10. Describe mechanism of action of Tetracycline and Rifampicin.
11. Describe replication cycle of influenza virus.
12. Define necrosis. Describe types of necrosis
13. What is Apoptosis? Describe apoptosis in biological processes.
14. Describe how cultured cells can be transformed into tumor cells.
15. Describe tetracycline
16. Explain the role of carcinogens and DNA repair in cancer.
17. Describe Adenovirus.
18. What is aging? Describe mechanism (theories) of aging
19. Describe formation of ROS during aging.
20. Describe parabiosis theory of aging in detail.
21. Describe replication cycle of parvovirus.
22. Describe Wear and tear theory
23. Describe genetic basis of cancer.
24. Describe in detail mechanism of formation of tumor.
25. Describe immunological changes during aging. Add note on lipofuscin grannules.
26. Describe Strategies of aging.
27. Describe different medicinal plants used as antiaging remedies.
28. Describe the process of transformation of normal cell to malignant cell.
29. Describe replication in HIV virus.
30. Describe in detail Rimfampicin. Add a note on mode of action.

Short answer Question (4 marks)

1. How aging affects on body system of human?

2. Draw two mechanisms for loss of heterozygosity (LOH) of tumor-suppressor genes.
3. Describe sub Cellular changes during ageing
4. Describe different types of stressful conditions of cell
5. Describe conversion of proto-oncogenes into oncogenes
6. Describe accumulation of toxins and chemical garbage due to aging.
7. Write note on Characteristics of cancer cell.
8. Write short note on Actinomycin A
9. Describe structure of HIV virus.
10. Describe effect of aging on coordination and integration.
11. Describe contrasting features of apoptosis and necrosis.
12. Describe mutations causing loss of growth-inhibiting and cell-cycle controls
13. Describe formation of lipofuscin granules during aging.
14. Write note on metastasis with well labeled diagram
15. Write short note on S V 40 virus
16. Describe biochemical changes in apoptosis.
17. Describe DNA repair in cancer.
18. Write a note on Wear and tear theory of aging and ROS formation.
19. How aging affects on body system of human?
20. Describe Ebola virus.
21. Draw two mechanisms for loss of heterozygosity (LOH) of tumor-suppressor genes.
22. Describe treatment of cancer.
23. Describe molecular changes in aging.
24. Describe the structure of Parvovirus.
25. Write note on Fat necrosis.
26. Describe accumulation of toxins and chemical garbage due to aging.
27. Describe Chloramphenicol.
28. Describe immunological Changes during aging.
29. Describe Mitomycin
30. Describe types of necrosis
31. Describe structure of polio virus.
32. Describe effects of aging on coordination and processing.
33. Describe accumulated mutation theory.
34. Describe immunology in cancer.
35. Describe types of cancer.
- 36.

