

TN XII-STD BIO-ZOOLOGY

Prepared By

GOPALAKRISHNAN RAMAN M.Sc., B.Ed.

POST GRADUATE TEACHER

DEPARTMENT OF ZOOLOGY

E-mail: gramakrishna1795@gmail.com

Mobile: 9025607324

CHAPTER-1 REPRODUCTION IN ORGANISMS

Short Questions:-

1. Reproduction 1
2. Sexual vs. asexual reproduction 1
3. Modes of asexual reproduction 1
4. Fission and its types 2
5. Types of binary fission – simple, transverse, longitudinal, oblique, repeated and multiple 2
6. Merozoites vs. sporozoites 3
7. Encystment 3
8. Strobilation 3
9. Plasmotomy 4
10. Sporulation 4
11. Budding and its types 5
12. Regeneration 6
15. Fragmentation 5
16. Epimorphosis 6
17. Gemmules formation 5
18. Fertilization and its types 7
19. Autogamy, exogamy, hologamy, paedogamy, merogamy, isogamy and anisogamy 7
20. Conjugation 7
21. What are the different phases of life cycle? 7
22. Types of breeding 7
23. Parthenogenesis and its types 7, 8
24. Paedogenesis 8
25. Oviparous, viviparous and ovoviviparous 8

Prepared By

GOPALAKRISHNAN RAMAN M.Sc., B.Ed.

POST GRADUATE TEACHER

DEPARTMENT OF ZOOLOGY

E-mail: gramakrishna1795@gmail.com

Mobile: 9025607324

Big Questions:-

1. Explain the different modes of asexual reproduction 1
2. Explain the fission and its types 2
3. Briefly discuss on parthenogenesis 7
4. Describe the modes of sexual reproduction 7
5. How the animals are classified based on site of development of embryo? 8

GOPALAKRISHNAN

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-2 HUMAN REPRODUCTION

Short Questions:-

1. What are major functions of reproductive system? 13
2. Why the scrotum is placed outside of the body? 14
3. What are the roles of inhibin? 14
4. Leydig cells 13
5. Cryptorchidism 15
6. List the name of ducts and accessory glands associated with the male reproductive system. 15
7. What is urethral meatus? 15
8. Mesovarium 16
9. Fimbriae 16
10. Ampulla 17
11. What are the layers present in the uterus wall? 17
12. Bartholin's gland 17
13. Areola 17
13. Gametogenesis 18
14. Spermiogenesis 19
15. Acrosome 19
16. Mitochondrial spiral or nebenkern 19
17. List the names of different phases of menstrual cycle 21
18. LH surge 21
19. Corpus albicans 22
20. Polycystic Ovary Syndrome (PCOS) 21
21. Menopause 23
22. What is the importance of hyaluronic acid? 23
23. Acrosomal reaction 23
24. Blastomeres 23
25. Morula 23
26. Blastocyst 23
27. Trophoblast 23
28. Ectopic pregnancy 24
29. Monozygotic vs. Dizygotic twins 24
30. Siamese twins 24
31. Gastrulation 25
32. Chorionic villi 25
33. Gestation period 25
34. Write the name of the hormones produced by the placenta 25

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramkrishna1795@gmail.com
Mobile: 9025607324

35. Braxter- Hick's contraction 26
36. Neurohumoral reflex 26
37. Colostrum 26
38. Layers of external genitalia or vulva 17
39. Importance of relaxin hormone

Big Questions:-

1. Major reproductive events in human beings 13
2. Explain about the human reproductive system 14
3. Briefly explain the processes spermatogenesis and oogenesis with the schematic presentation 18
4. Describe the structures of human sperm and ovum 19
5. Explain the various phases of menstrual cycle 21
6. Discuss the different stages of embryonic development 24

GOPALAKRISHNAN

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-3 REPRODUCTIVE HEALTH

Short questions:-

1. Amniocentesis 35
2. Foeticide vs. infanticide 35
3. PCPNDT Act 35
4. POCSO Act 35
5. What are the birth control methods? 35
6. Periodic abstinence 36
7. Continuous abstinence 36
8. Lactational amenorrhoea 36
9. Coitus interruptus 36
10. Types of barriers used in barrier method 36-37
11. Intrauterine devices 37
12. Tubectomy 37
13. Vasectomy 37
14. How to prevent the STDs? 38
15. What is assisted reproductive technology? 41
16. List the name of different techniques used in ART 41
17. Embryo transfer technique 41
18. What is infertility? and what are the causes of infertility? 40
19. What are diagnostic methods are used to detect the cervical cancer? 40
20. Symptoms of cervical cancer 40
21. Mayer-Rokitansky syndrome 41
22. What are the copper releasing IUDs?
23. What are the major tasks carried out by RCH? 34
24. Prevention of male infertility 42
25. Surrogacy
26. Chorionic villus sampling (CVS) 43
27. Foetoscope 43

Big Questions:-

1. Briefly explain the birth control methods 36
2. What is STD? Discuss any ten STDs with its causative agents and symptoms 38-39
3. Explain all the assisted reproductive technologies with the procedure 41
4. Describe the different methods used to detect the foetal disorders 42

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-4 PRINCIPLES OF INHERITANCE AND VARIATION

Short Questions:-

1. Multiple allelism 47
2. Rh factor 49
3. Wiener hypothesis 49
4. What is erythroblastosis foetalis? 50
5. How to prevent erythroblastosis foetalis? 50
6. ZO-ZZ type 51
7. ZW-ZZ type 51
8. XX-XO type 50
9. Barr body 52
10. What is haplodiploidy?
11. Kin selection
12. Holandric genes or Y- linked genes
13. Sex linked inheritance 53
14. Karyotyping 54
15. Applications of karyotyping 55
16. Karyotype 55
17. What are the mendelian disorders? 56
18. Cooley's anemia 56
19. Aneuploidy 57
20. Syndrome 57
21. Down's syndrome/ Trisomy-21
22. Criss-cross inheritance 54
23. Heterogametic sex determination 50

Big Questions:-

1. Explain the chromosomal basis of sex determination 50
2. What will happen while a colour blind man marries normal visioned women? 54
3. What will happen while a normal visioned man marries colour blind women? 54
4. Explain the mendelian disorders 56
5. Discuss the different types of chromosomal abnormalities 57

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-5 MOLECULAR GENETICS**Short Questions:-**

1. One gene and one polypeptide hypothesis 64
2. Chromosome 64
3. VNTR 87
4. Transformation 65
5. Expand RNA and DNA 67
6. Nucleoside 67
7. Nucleotide 67
8. Genophore 70
9. Nucleosomes 70
10. Histone octamere 70
11. DNA replication 70
12. Replication fork 73
13. Pribnow box and TATA box 73, 74
14. Template strand vs. coding strand 74
15. Differentiate it. Monocistronic vs. polycistronic genes 74
16. Applications and future challenges of HGP 86
17. Define it - Exon, intron, splicing and tailing 75
18. Genetic code 76
19. Why the t RNA is called as adapter molecule? 79
20. Aminoacylation 79
21. Structure of operon 84
22. Microsatellites 85
23. Shotgun sequencing 85
24. Applications of DNA finger printing 88
25. Pharmacogenomics 86

Big Questions:-

1. What are the properties of genes?
2. Explain the Hershey and Chase experiment.
3. What are the nucleic acids and discuss about their chemistry.
4. Properties of genetic material
5. Give an experimental proof of DNA replication
6. Explain the mechanism and enzymes involved in the replication
7. Briefly explain the process of transcription
8. Write the salient features of genetic codes
9. Describe the structure of t RNA
10. Discuss the goals, features, applications and future challenges of HGP
11. Describe the DNA fingerprinting technique

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-6 EVOLUTION

Short Questions:-

1. Coacervates 94
2. Big bang theory 94
3. Special creation theory 94
4. Write the ERAs of geological time scale 95
5. Paleontology 97
6. Petrification 97
7. Connecting links 99
8. Atavistic organs 99
9. Convergent evolution 98
10. Analogous structures 98
11. Homologous structure 98
12. Vestigial organs 99
13. Ontogeny vs. phylogeny 100
14. Define the theory of Lamarck's use and disuse theory 100
15. What are the main objections to Lamarckism? 100
16. Neo - Lamarckism 100
17. Theory of Natural selection 101
18. Objections to Darwinism 101
19. Salient features of mutation theory 102
20. Explain the Natural selection through industrial melanism 102
21. Adaptive radiation 103
22. Darwin's finches 103
23. Genetic drift or Sewall wright effect 105
24. Gene flow 105
25. Difference between divergent and convergent evolution 98
26. How does Neanderthal man differ from the modern man in appearance?
107
27. Coprolites 98
28. State Hardy - Weinberg law only 106
29. Mention few similarities found common in Neanderthal man and *Homo sapiens*
30. What are the methods used to determine the age of fossils?
31. Liposomes 96
32. Protobionts 96
33. Molecular evidences for evolution 100

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

Big Questions:-

1. Describe Urey – Miller’s experimental approach to the origin of life 96
2. What are the paleontological evidences for evolution? 97
3. Submit the evidences for evolution from embryology and comparative anatomy 98, 99
4. Explain the theories of biological evolution (Lamarck and Darwin’s theories) 100, 101
5. Explain the Hardy – Weinberg principle 106
6. Write an essay on Origin and evolution of man 107
7. Modern synthetic theory 102

GOPALAKRISHNAN

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-7 HUMAN HEALTH AND DISEASES**Short Questions:-**

1. Pathogens 111
2. Bacterial resistance 112
3. Types of viral diseases 113
4. Trophozoite 115
5. List the name of different species of Trypanosoma causing sleeping sickness in man? 115
6. Draw and label the parts – Entamoeba, Trypanosoma gambiense, Ascaris
7. Merozoites 116
8. Types of malaria 117
9. Immunity and its types – (Natural and Acquired) 120
10. Haematopoiesis 122
11. Lymphoid organs 123
12. Bone marrow 124
13. Peyer's patches 123
14. Tonsils 124
15. Types of antigens 127
16. Draw – Immunoglobulin 127
17. Haptens 127
18. Adjuvants 127
19. Epitope 127
20. Paratope 127
21. Precipitin 128
22. Agglutination 128
23. Opsonization 128
24. Neutralization 129
25. Vaccines 129
26. Vaccination 130
27. Immunization 130
28. Allergens 138
29. Types of vaccines 130
30. Draw – HIV 131
31. Metastasis 132
32. Difference between normal cell and a cancer cell 133
33. Euphoria 135
34. Liver chirrrosis 136
35. Main sources of natural cannabinoids 134

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

36. Cannabinoids 134
37. Signs and symptoms of mental depression 137
38. Define – GALT, MALT, BALT
39. What are the adenoids?
40. Bursa of fabricius 123
41. Morphine and its uses
42. Antigenicity 127
43. Histocompatibility antigens 127
44. Write the different phases of Plasmodium life cycle 116
45. Schuffners granules 116

Big Questions:-

1. Briefly discuss about some of the bacterial and viral diseases in human beings 113, 114
2. Explain the lifecycle process of Plasmodium 116
3. Different between active and passive immunity 122
4. Describe the structure of Antibody 127
5. Explain about the different types of vaccines 129
6. Explain different types of antigen and antibody reactions 128
7. Describe the structure and transmission of HIV 131
8. Write the effects of drugs and alcohol and how to control and prevent alcoholism?
9. Primary vs. secondary immune responses – Differentiate it 112

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-8 MICROBES IN HUMAN WELFARE**Short Questions:-**

1. Prebiotics vs. Probiotics – Differentiate it 143
2. Single cell protein 143
3. Fermentors 143
4. Antibiotics 143
5. Write the name of antibiotics derived from microbes 144
6. Hypersensitivity 144
7. Zymology 145
8. Oenology 145
9. Biodiesel 146
10. Cyclosporin A 146
11. Write the important assignment taken up under NRCP 148
12. What are the plans taken to save the major rivers of the country? 148
13. Define the Ganga and Yamuna action plan 148
14. Methanogens 148
15. Gobar gas 148
16. Crytoxin 149
17. Delta – endotoxin 149
18. What are the specific activities against the insects in Delta - endotoxin? 149
19. Mycorrhiza 150
20. Cyanobacteria 150
21. Key features of organic farming 150
22. In-situ vs. Ex-situ bioremediation 150
23. Activated sludge 147
24. Anaerobic sledge digesters 147
25. Bioremediation 151
26. Microbial fuel cell 148
27. Penicillin 144
28. Write the equation for fermentation of glucose 146

Big Questions:-

1. Write on microbes in household products 142
2. Explain the industrial applications of microbes 143
3. What are the fermented beverages? 145
4. How the microbes used in sewage treatment and energy generation? 146
5. Explain the process of bioremediation using microorganisms 151

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-9 APPLICATIONS OF BIOTECHNOLOGY**Short Questions:-**

1. Dwarfism 158
2. Interferons 158
3. Types of recombinant vaccines 158
4. Subunit vaccines 158
5. Gene therapy 159
6. Differentiate it – Somatic cell gene therapy vs. Germ line gene therapy 160
7. Stem cells 161
8. Types of stem cells 161
9. Gene augmentation therapy 159
10. Cord blood banking 162
11. What are the molecular techniques used to diagnose the kinds of disorders? 162
12. ELISA 163
13. Denaturation 163
14. Types of ELISA 163
15. Applications of PCR 165
16. Transgenesis 165
17. What are the steps involved in the production of transgenic organisms?
18. GMO or transgenic animals 165
19. Uses of Transgenesis 165
20. Totipotency 161
21. Oligopotency 161
22. Pluripotency 161
23. Multipotency 161
24. Unipotency 161
25. Somatic cell nuclear transfer 157
26. How the Hemophilia treated using r DNA technology? 158

Big Questions:-

1. Explain the production mechanism of Recombinant human insulin 156
2. Explain the production mechanism of human growth hormone 157
3. Describe the type recombinant vaccines 158
4. Briefly explain the processes involved in PCR 163
5. Describe the mechanism of animal cloning 166
6. Advantages and disadvantages of cloning 167
7. See the figure 9.9 – Production transgenic animals 166
8. Explain the process of gene therapy 159

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-10 ORGANISMS AND POPULATION**Short Questions:-**

1. Habitat 172
2. Niche or Ecological Niche 172
3. Van't Hoff's rule 173
4. Bergman's rule 173
5. Allen's rule 173
6. Jordon's rule 173
7. Stenotherms 174
8. Phototaxis 174
9. Phototropism 174
10. Photokinesis 174
11. Major functions of soil 175
12. Population density 185
11. Porosity 176
12. Crude density 185
13. Ecological density 185
14. Relative abundance 185
15. Habitat vs. Niche – Differentiate it 172
16. Acclimatization 176
17. Characters of biome 177
18. What are the aquatic biomes of earth? 177
19. What are the major biomes of the earth? 178
20. Characteristic features of Tundra 179
21. Coriolis effect 176
22. Based on the Seasonal distribution of rainfall, how can you classify the tropical forests? 180
24. What are the types of temperature forests based on the Seasonal distribution of rainfall? 181
25. Difference between hot desert and cold desert 181, 182
26. Regulators 182
27. Conformers 183
28. Migration 186
29. Difference between hibernation vs. aestivation 183
30. Diapause 183
31. Adaptation 183
32. Camouflage 183
33. Ethology 183

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

34. Adaptations of aquatic animals 184
35. Adaptations of terrestrial animals 184
36. Population density 184
37. Natality 185
38. Mortality 185
39. Population dispersion 186
40. Emigration 186
41. Immigration 186
42. Difference between r- selected species and k selected species 187
43. Anadromous vs. catadromous migration 186
44. Biotic potential 187
45. Carrying capacity 187
46. Environmental resistance 187
47. Difference between intraspecific vs. interspecific interaction 188
48. What are the types of interaction found in organism? 188
49. Tundra vs. taiga 178, 179
50. Paedogenesis 175
51. Paedosphere 175
52. Properties of soil 175
53. Properties of water 175

Big Questions:-

1. Describe the major abiotic components 173
2. You should know about all the biomes
3. Explain the types of animal interactions 188
4. Briefly explain the kinds of adaptations seen in animals 183

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

CHAPTER-11 BIODIVERSITY AND ITS CONSERVATION

Short Questions:-

1. Concept of biodiversity 194
2. Levels of biodiversity 194
3. Species richness 194
4. Three indices of species diversity – Alpha, Beta and Gamma 195
5. Community/ Ecosystem diversity 195
6. Write the name of Indian realms and biomes 195
7. What are the factors determine biodiversity distribution patterns? 196
8. What are the reasons for biodiversity richness in the tropics? 196
9. List the name of bio-geographical regions of India 198
10. Habitat loss 200
11. Habitat fragmentation 201
12. What are the causes of biodiversity loss 200?
13. Which is the Lungs of the planet? why? 201
14. What is Exotic species? Give an example for exotic species invasion 201
15. Shifting or Jhum cultivation/ Slash and burn agriculture 202
16. Co-extinction – define with example 202
17. Write the names of Indian biodiversity hotspots 204
18. Hotspot 204
19. What is extinction? What are the types of extinction? 204
20. Endangered species 204
21. What are the purposes of preparation of red list? 205
22. General strategies in conservation 206
23. Explain the types of conservation - (in situ and ex situ)
24. What are the national parks located in Tamil Nadu? 207
25. What are the wild life sanctuaries located in Tamil Nadu? 207
26. Biosphere reserve 207
27. Name of the Biosphere reserves found in Tamil Nadu 208
28. Gene banks 208
29. Difference between in-situ and ex-situ conservation 208
30. What are the natural threats to biodiversity? 203

Big Questions:-

1. Explain the level of biodiversity 194
2. Importance of biodiversity 197
3. Briefly explain all the bio-geographical regions of India 198
4. Describe the major causes of biodiversity loss 200
5. Explain the methods of biodiversity conservation 206

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
 POST GRADUATE TEACHER
 DEPARTMENT OF ZOOLOGY
 E-mail: gramakrishna1795@gmail.com
 Mobile: 9025607324

CHAPTER-12 ENVIRONMENTAL ISSUES**Short Questions:-**

1. Pollution 213
2. Pollutants 213
3. Types of pollutants 214
4. Air pollution 214
5. Sources of nitrogen oxide 215
6. Major causes of acid rain 215
7. Main sources of air pollution 215
8. What is smog? And how it is created? 216
9. Effect of Peroxyacetyl nitrate 216
10. Global warming 216
11. Ozone depletion 216
12. Acid rain 216
13. AQI 217
14. What are the types of sources of water pollution? 217
15. Prevention of water pollution 219
16. Sources of noise pollution 220
17. Effects of noise pollution 220
18. How to control the noise pollution 220
19. Agrochemicals 220
20. Bio-magnification 221
21. What are the chemicals used in mosquito repellents? Write their effects 221
22. Colony collapse syndrome 221
23. Eutrophication 222
24. Cultural or accelerated eutrophication 222
25. List out the physical, chemical and biological methods of wastewater treatment 222
26. Major sources of solid wastes 224
27. What are the methods used to dispose radioactive wastes? 225
28. Greenhouse gases 227
29. What are the methods used to dispose medical wastes? 226
30. Name the hazardous substances found in a personnel computer 226
31. What are the ozone depleting substances (ODS)? 228
32. How can we control the depletion of ozone layer? 228
33. Ecosan toilets 229
34. Deforestation 228
35. Chipko movement

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324

36. Who is the forest man of India? Why?

Big Questions:-

1. You should aware about all kind of pollutions and its causes, prevention and control measures
2. Briefly explain the integrated wastewater management 222
3. Discuss on radioactive waste and its management 225
4. Explain the causes and effects of ozone depletion 227

GOPALAKRISHNAN

Prepared By
GOPALAKRISHNAN RAMAN M.Sc., B.Ed.
POST GRADUATE TEACHER
DEPARTMENT OF ZOOLOGY
E-mail: gramakrishna1795@gmail.com
Mobile: 9025607324