Year - April 2024

MSC - Zoology

SEM - II

No. of pages - 7

Paper / Subject Code: 92238 / Zoology BIOCHEMISTRY AND BIOTECHNOLOGY (R-2020)

MSC - sem - II

Duration: 2 ½ Hrs. **Maximum Marks: 60**

Instructions-

1. **All questions are compulsory.**
2. **All questions carry equal marks.**
3. **Draw neat and labeled diagrams wherever necessary.**

Q. 1 Briefly answer/Short Note **any three** questions from the following.

a) Central role of Carbon **4**
b) Ionization of water **4**
c) Free radicals **4**
d) Endergonic reactions **4**
e) Cot curves **4**
f) C-value paradox **4**
g) Monoclonal antibodies (mAbs) **4**
h) Pharmacogenomics **4**

Q. 2 Answer **any two** questions from the following.

a) Comment upon Classification and functions of chylomicrons **6**
b) Discuss Chirality, and Isomerization in biomolecules **6**
c) Briefly describe Ramachandran's plot and its significance **6**

Q. 3 Answer **any two** questions from the following.

a) Discuss Metabolism of Amino acids **6**
b) Comment upon Regulation of metabolic flux by genetic mechanisms **6**
c) Discuss briefly Glycolysis and its energetics **6**

Q. 4 Answer **any two** questions from the following.

a) Discuss the Molecular model of DNA replication **6**
b) Comment upon Microarrays and their significance **6**
c) Describe Chromosome walking **6**

Q. 5 Answer **any two** questions from the following.

a) Give a broad outline and applications of Pollen culture **6**
b) Comment upon Peptide vaccines **6**
c) Give a detailed outline of HIV therapeutic agents **6**

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Paper / Subject Code: 92237 / Zoology DEVELOPMENTAL BIOLOGY II (R-2020)

MSC. Sem. II

Duration: 2.5 hours **Maximum Marks: 60**

Instructions-

1. All questions are compulsory.
2. All questions carry equal marks.
3. Draw neat and labeled diagram wherever necessary.

Q. 1 Answer **any three** questions from the following.

a) Prostate glands 4
b) Fertilization in Urochordata. 4
c) Role of pheromones in mammals. 4
d) Courtship behavior in Aves. 4
e) Bone regeneration theory. 4
f) Embryonic stem cells. 4
g) Morphogenic constraints on evolution 4
h) Role of heavy metals as teratogens. 4

Q. 2 Answer **any two** questions from the following.

a) Write briefly the role of accessory glands in male reproductive system. 6
b) Describe male reproductive system in frog. 6
c) Explain female reproductive system in pigeon. 6

Q. 3 Answer **any two** questions from the following.

a) Explain mammary gland differentiation in humans. 6
b) Explain biochemistry of human semen. 6
c) Explain term sperm specification and despecification. 6

Q. 4 Answer **any two** questions from the following.

a) Explain germ cell migration in lizard. 6
b) Give tools, techniques used for cryopreservation of stem cells. 6
c) Explain induced breeding techniques in fishes. 6

Q. 5. Answer **any two** questions from the following.

a) Explain environmental and epigenetic causes of aging. 6
b) Describe the role of telomerase in promoting longevity. 6
c) With suitable example explain modularity of development. 6

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MSC - Sem - II

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Paper / Subject Code: 92239 / Zoology RESEARCH METHODOLOGY Paper IV (2020)

Duration: 2.5 h **Maximum Marks: 60**

Instructions-

1. All questions are compulsory.
2. All questions carry equal marks.
3. Draw neat and labeled diagram wherever necessary.

Q. 1 Answer **any three** questions from the following.

a) Literature review 4
b) Characteristics of good research design 4
c) Types of charts 4
d) Z - test 4
e) Zotero 4
f) Web of Science 4
g) Daphnia as a model organism 4
h) Transgenic mouse models 4

Q. 2 Answer **any two** questions from the following.

a) Explain in brief characteristics of research 6
b) Explain function, characteristics and types of hypothesis 6
c) Describe the characteristics of good research design . 6

Q. 3 Answer **any two** questions from the following.

a) Explain various ways of tabulation of data 6
b) Write a note on standard deviation and variance 6
c) Explain types of errors encountered in testing of hypothesis 6

Q. 4 Answer **any two** questions from the following.

a) Explain the concept of thesis and dissertation 6
b) Write a note on impact factor of journals 6
c) Give a proposal layout for permission from IAEC for use of animals in research 6

Q. 5. Answer **any two** questions from the following.

a) Describe the advantages and limitations of using Zebra fish as a model organism 6
b) Describe the discovery of RNAi in *C.elegans* 6
c) Explain the use of Drosophila as a model for therapeutic drug discovery 6

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MSc - sem - II

Duration: 2 ½ Hrs. **Maximum Marks: 60**

Instructions-

1. **All questions are compulsory.**
2. **All questions carry equal marks.**
3. **Draw neat and labeled diagrams wherever necessary.**

Q. 1 Write short notes on **any three** of the following.

a)	Origin and ancestry of Protochordates	**4**
b)	General features of Cephalochordates	**4**
c)	General characters of Dipnoi fishes	**4**
d)	Origin of Mammals	**4**
e)	Splanchnocranium	**4**
f)	Gills	**4**
g)	Lateral line sense organ in Fish	**4**
h)	Dentition in Mammals	**4**

Q. 2 Answer **any two** questions from the following.

a)	Give an account on Life history of Herdmania.	**6**
b)	Give an account on Life history of Petromyzon	**6**
c)	Give an account on Life history of Branchiostoma	**6**

Q. 3 Answer **any two** questions from the following.

a)	Give a general account on ancestry of Chordates.	**6**
b)	Comment on origin of Birds and affinities with Reptiles.	**6**
c)	Give a brief account on phylogeny of terrestrial and aquatic Mammals.	**6**

Q. 4 Answer **any two** questions from the following.

a)	Write briefly about the skull in different Vertebrates.	**6**
b)	Comment on evolutionary development of Kidney.	**6**
c)	Give a comparative anatomy of eyes in Vertebrates.	**6**

Q. 5 Answer **any two** questions from the following.

a)	Give a general account on migration of Pisces.	**6**
b)	Give a brief account on venom apparatus and biting mechanisms in Snakes.	**6**
c)	Comment on flight adaptations in Birds.	**6**

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MSC – Zoology – Sem II – NEP2020

Duration: 1 Hrs **Maximum Marks: 25**

General instructions-

1. All questions are compulsory.
2. All questions carry equal marks except question no. 1 that carries 9 marks.
3. Draw neat and labelled diagram wherever necessary.
4. Answer precisely with suitable example if necessary.

Q. 1 Attempt **any three** questions from the following. 9

a) What are the importance of fibers in food? 3
b) Describe the types of nutrients for growth and development. 3
c) Discuss the remedies for combating Anemia. 3
d) Explain the causes and strategies for stress management 3
e) Describe the initiatives for prevention of water-borne disease. 3
f) Elaborate on Millennium Development Goals (MDGs)? 3

Q. 2 Attempt any two questions from the following. 8

a) Explain Food pyramid and its benefits in planning diet for different age groups. 4
b) Describe the concept of BMI and its use in determining health status. 4
c) Elaborate on symptoms and remedies of Gastritis and Peptic Ulcers. 4

Q. 3 Attempt any two questions from the following. 8

a) Describe the vision and objective of National Rural Health Mission. 4
b) Discuss the influence of Media on food choice. 4
c) How Yoga and Meditation helps in maintaining active and healthy life? 4

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MSc - Zoology - Sem II - NEP2020

Duration: 2 Hours **Maximum Marks:** 50

Instructions: -

1. All questions are compulsory.
2. All questions carry equal marks.
3. Draw neat and labelled diagrams wherever necessary.
4. Answer precisely with a suitable example if necessary

Q. 1 Attempt **any four** questions from the following.	**10**
a) Reproduction in Amphioxus	2.5
b) Reproduction in Aves	2.5
c) Describe the biochemistry of mammalian sperm.	2.5
d) Describe courtship behaviour in Pisces.	2.5
e) Describe the significance of adult stem cells	2.5
f) Describe Induced breeding techniques in fish	2.5
g) Comment upon Heavy metals as teratogens	2.5
h) Discuss morphogenetic developmental constraints on evolution	2.5

Q. 2 Attempt **any two** questions from the following.	**10**
a) Describe briefly the reproductive system in Tunicates.	5
b) Describe the male reproductive system of mammalians.	5
c) Comment briefly upon the accessory reproductive glands in human.	5

Q. 3 Attempt **any two** questions from the following.	**10**
a) Describe molecular mechanisms of Sperm capacitation	5
b) What are pheromones. Comment upon their significance in mammals.	5
c) Courtship behaviour in Pisces.	5

Q. 4 Attempt **any two** questions from the following.	**10**
a) Describe Germ cell migration in Zebrafish briefly.	5
b) What are Embryonic stem cells? Comment on their significance.	5
c) Describe the Cryopreservation techniques of stem cells.	5

Q. 5. Attempt **any two** questions from the following.	**10**
a) Describe the role of temperature in sex determination in turtles.	5
b) Enlist various epigenetic factors causing aging in human.	5
c) Describe the causative factors of teratogenesis.	5

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Paper / Subject Code: N57412 / Chordates

MSC - Zoology - Sem II - NEP 2020

Duration: 2 h **Maximum Marks:** 50

Instruction -

1. All questions are compulsory.
2. All questions carry equal marks.
3. Draw neat and labeled diagram wherever necessary.
4. Answer precisely with a suitable example if necessary

Q. 1 Attempt **any four** questions from the following. 10

a) Write a note on origin and ancestry of Protochordates. 2.5
b) Give salient features of Ostracoderm. 2.5
c) Describe deep sea adaptation of fishes. 2.5
d) Give an account on origin of mammals. 2.5
e) Write a note on archinephros. 2.5
f) Describe Splanchnocranium in vertebrates. 2.5
g) How does the lateral line sense organ function in Pisces? 2.5
h) Write a note on migration in birds. 2.5

Q. 2 Attempt **any two** questions from the following. 10

a) Describe the characteristics of subphyla Urochordates and Cephalochordates. 5
b) Discuss the life history of Herdmania and its phylogenetic affinities 5
c) Differentiate the resemblances between Cyclostomes and Vertebrates. 5

Q. 3 Attempt **any two** questions from the following. 10

a) Describe the general characters of Dipnoi and their affinities with fishes. 5
b) Discuss the concept of paedomorphosis with examples from amphibians. 5
c) Explain the cursorial and arboreal theories of flight origin. 5

Q. 4 Attempt **any two** questions from the following. 10

a) Describe the anatomy of brain in vertebrates. 5
b) Explain the structure of lungs in amphibians and reptiles. 5
c) Illustrate male and female reproductive and urinary ducts of Aves with suitable diagram. 5

Q. 5. Attempt **any two** questions from the following. 10

a) Describe the venom apparatus and biting mechanism in snakes. 5
b) Discuss the evolutionary significance of Labyrinthodonts in Amphibia. 5
c) Compare the mechanisms of jaw suspension in mammals. 5

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