Year- April 2024

MSC-

Zoology

(SEM - I)

No. of pages - 9

Paper / Subject Code: N57491 / Research Methodology

MSC (Zoology) NEP 2020

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

Instructions:

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

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

a) Enlist various objectives of research. 2.5
b) Explain the null (H0) and alternative hypothesis (HA) using suitable example. 2.5
c) What are the primary sources for research data collection? 2.5
d) Distinguish between the one-tailed and two-tailed statistical tests. 2.5
e) List the names (in full) of five research funding agencies. 2.5
f) Write a note on predatory journals. 2.5
g) Explain the benefits of using *Drosophila* as model system? 2.5
h) Give the importance of *Earthworm* as model for regenerative studies. 2.5

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

a) Explain various types of research categories. 5
b) Describe the characteristics of good research design. 5
c) Elaborate on types of study designs. 5

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

a) Compare and contrast type-I and type-II errors in hypothesis testing. 5
b) Describe different chart types for data presentation. 5
c) Enlist non-parametric tests and comment on any two of them. 5

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

a) Briefly describe various reference management software. 5
b) Outline the benefits and drawbacks of single- and double-blind review process. 5
c) How are the h-index and i-10 index calculated? 5

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

a) Explain why *Daphnia* is a good model to use in toxicological research? 5
b) Outline the benefits and drawbacks of using *Danio rerio* as a model system. 5
c) State the concept and uses of knockout and transgenic mice models. 5

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MSC - Sem I - Zoology (NEP 2020)

Duration: 1 Hours **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) Describe structure of Cytochrome 'c in eukaryotes

b) Describe concept of haemogobin as model of evolution

c) Write major events in evolutionary time scale

d) Describe concept of pseudogenes

e) Describe concept of overlapping genes

f) Describe strategies of gene cloning

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

a) Describe theory of evolution of sex chromosomes

b) Explain concept of frozen Zoo

c) Explain maternal mtDNA inheritance in humans

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

a) Explain concept of structural genes with example

b) Explain theory of evolution of split genes

c) Explain applications of gene cloning in DNA analysis in research

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M.Sc (Zoology) NEP-2020 Sem - I (3)

Paper / Subject Code: N57431 / Genetics and Evolution

Duration: 1 h **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) Discuss the role of Haemoglobin as a model of evolution 3

b) What are cox genes. Explain in detail. 3

c) Discuss the role of Paternal and maternal mtDNA inheritance in humans. 3

d) Comment upon significance of Genomic Library. 3

e) Describe the Evolution of split genes. 3

f) Short note on gene mapping. 3

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

a) Discuss the role of Cytochrome 'c' in Primates. 4

b) Describe Sex based gene expression. 4

c) Explain in detail the Process of C-14 Carbon dating. 4

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

a) Enlist the applications of gene library. 4

b) Give Definition and enlist strategies of gene cloning. 4

c) Describe Parallelism between random drift and inbreeding. 4

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Paper / Subject Code: N57421 / Developmental Biology I

MSC - zoology - sem I (NEP-2020)

Duration: 2 Hours

Maximum Marks: 50

Instructions

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

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

a) Write a note on capacitation of sperm.
b) Explain coelom formation in protostomes.
c) Write a note on conditional specification.
d) Give an account on potency.
e) Explain pattern of cleavage in *Drosophila*.
f) Explain autonomous cell specification in *C. elegance*.
g) Explain polyembryony in *Fasciola sp.*
h) Write a note on amphiblastula larva of porifera.

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

a) Briefly explain the significance of amphimixis.
b) Explain the role of binding protein in species specific recognition of gametes.
c) Explain germ layer formation in detail.

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

a) Compare and contrast mosaic and regulative development.
b) Explain the role of induction in embryonic development.
c) Describe autonomous specification and its role in embryonic development.

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

a) Explain anterior-posterior axis formation in *C. elegans*.
b) Explain the process of blastulation in *Drosophila*.
c) Investigate the roles of homeo selector gene complexes in *Drosophila*.

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

a) Describe metagenesis in detail with suitable example.
b) Explain types of metamorphosis in insects.
c) Explain pheromones in invertebrates and their role as sex attractants.

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(R-2019)

MSc & MSc (Research)

Sem I

(5)

Time: 2 1/2 hrs

Marks: 60

Note: 1. All questions are compulsory
2. Draw neat and labeled diagram wherever necessary

Q.1	Write short notes on **any three** of the following.	12
a.	Hepatopancreas of Prawn	
b.	Coiled nephridia in clamworm	
c.	Tube feet in starfish	
d.	Gill slits in Hemichordata	
e.	Chromatophores in Prawn	
f.	Ectoneural nervous system in stomach	
g.	Graptolite fossil	
h.	Echnoid fossil	
Q.2	Describe **any two** of the following in detail	12
a.	Water vascular system in starfish.	
b.	Hepatopancreas in Pila	
c.	Digestive pharynx in Balanoglossus	
Q.3	Describe **any two** of the following in detail	12
a.	Heart and blood lacuna in Prawn	
b.	Ventral blood vessel and transverse vessel in clamworm	
c.	Pricardium and heart of Pila	
Q.4	Describe **any two** of the following in detail	12
a.	Testes and ovaries in clamworm	
b.	Saccular gonads in Balanoglossus	
c.	Male reproductive system of Pila	
Q.5	Write a detail note of **any two** of the following	12
a.	Similarities and differences between Annelids and Molluscs	
b.	Affinities of Echinodermata with Hemichordata	
c.	Phylogenetic relationships of Trochophore Larva	

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M.Sc - Zoology - Semester

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) Buccal cavity of Prawn. 4
b) Digestive glands of starfish. 4
c) Parapodia in clamworm. 4
d) Pericardium in Pila. 4
e) Compound eyes of Prawn. 4
f) Female gonads in starfish. 4
g) Graptolite fossils. 4
h) Affinities of Annelida with Hemichordata 4

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

a) Explain the general organization of digestive systems of Annelids. 6
b) Describe the denticles in Clamworm. 6
c) Describe the Glomerulus or Proboscis gland digestive systems of Balanoglossus. 6

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

a) Describe the dermal papulae and tube feet of Starfish. 6
b) Explain the dorsal and ventral blood vessel of Clamworm. 6
c) Describe the Heart and Blood lacunae of Prawn. 6

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

a) Describe the cerebral ganglia,and buccal ganglia of Pila. 6
b) Explain the Gonads - testes and ovaries of Clam worm: 6
c) Describe the Saccular gonads of Balanoglossus: 6

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

a) Describe the trilobites found in Kashmir. 6
b) Explain the fossils of Annelids: Serpula. 6
c) Describe the affinities of Echinodermata with Hemichordata 6

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Paper / Subject Code: N57411 / Non-chordates

msc - Zoology — NEP 2020

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

Instructions-

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

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

a) Water vascular system of Starfish
b) Green glands of Prawn
c) Parapodia in Clamworm
d) Pericardium of Pila
e) Pigmented retinol cells of Clamworm
f) Neurosecretory cells of Blanoglossus
g) Graptolite fossils
h) Phylogenetic ralationship of Trochophore larva

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

a) Hepatopancreas of Prawn
b) Proboscis gland of Balanoglossus
c) Salivary glands of Pila

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

a) Heart and blood lacunae of Prawn
b) Dermal papulae of Starfish
c) Gill slits of Blanoglossus

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

a) Temperature receptors of Pila
b) Sinus gland X organ of Prawn
c) Terminal tentacles of Starfish

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

a) Affinities of Annelida with Hemichordata
b) Echnoid fossils found in India
c) Phylogeny of Arthropods

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(2)

M.Sc – Zoology – NEP 2018

Duration: 1 Hour | 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) Write biological significance of thermal properties of water 3

b) Write monomer structure of Carbohydrates 3

c) What is glycolysis? Describe it in short. 3

d) What is C-value paradox? Describe it in short 3

e) Write about transcription in eukaryotes 3

f) Describe about BAC vector 3

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

a) Write about molecular structure and solvent properties of water 4

b) Write classification in short and functions of chylomicrons 4

c) Describe Glycogenesis in brief 4

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

a) Write molecular model of DNA replication. 4

b) Write in brief about Microarrays 4

c) Describe bioremediation with suitable example 4

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