MSC - Zoology - Sem I

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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M.Sc - Zoology - NEP2020 - Sem I

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) List the various characteristics of research.
b) Define hypothesis and state its function in research.
c) What are secondary sources of data collection?
d) Explain the purpose of the Mann-Whitney test.
e) Enlist and write the importance of any 2 types of reference management software.
f) Explain the concept of impact factors in research journals.
g) What are model organisms and why are they important in scientific research?
h) List advantages and limitations of using *Drosophila* in research.

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

a) Explain the different types of research with examples.
b) Describe the process of reviewing literature and its significance.
c) Explain the strategies for determining sample size in research design.

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

a) Describe any three types of charts used in data presentation.
b) Explain multivariate analysis with a focus on ANOVA and its types.
c) Discuss the importance of level of significance and p-value in hypothesis testing.

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

a) What is the difference between single-blind and double-blind peer review?
b) Explain research grants, scholarships, & fellowships available to Indian students.
c) What is the process of obtaining an ISSN?

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

a) Explain the importance of earthworms in regeneration studies.
b) List the advantages and limitations of using *Mus musculus* in research.
c) What is RNAi, and how was it discovered using *C. elegans*?

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Paper / Subject Code: N57421 / Developmental Biology I

MSC - 2001 ogy NEP2020 Sem - I

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) Write a note on concept and types of fertilization. 2.5

b) Comment on coelom formation between Protostomes and Deuterostomes. 2.5

c) Write the significance of cell induction during development of organism. 2.5

d) Describe the syncytial mode of cell specification. 2.5

e) Discuss on the cleavage pattern in *Caenorhabditis elegans*. 2.5

f) Describe how *Drosophila*'s anterior-posterior axis develops. 2.5

g) Describe how hormones affect the insect metamorphosis. 2.5

h) Explain morphallaxis type of regeneration using suitable example. 2.5

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

a) Describe the sperm capacitation mechanism. 5

b) Explain fertilizin-antifertilizin reaction in gamete recognition? 5

c) Describe the events that occur during the activation of sea urchin egg metabolism. 5

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

a) Explain competence with an appropriate example. 5

b) Using an appropriate example, describe the mosaic development pattern. 5

c) Compare and contrast autonomous and conditional specification. 5

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

a) Describe the process of gastrulation in *Caenorhabditis elegans*. 5

b) Explain the cleavage pattern in *Drosophila*. 5

c) Comment on homeotic genes in *Drosophila*. 5

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

a) Explain various types of insect metamorphosis with suitable example. 5

b) Describe the process of conjugation in *Paramecium*. 5

c) Describe the importance of imaginal discs in insect development. 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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