



Seat No. : _____

NG-148

November-2025

M.Sc., Sem.-III

502 : Zoology

(Developmental Biology & Molecular Medicine)

Time : 2:30 Hours]

[Max. Marks : 70

1. (A) Write a note on Nanos. 7
1. (B) Explain the functioning of gap genes in the development of Drosophila. 7

OR

1. (A) Explain the concept of a gradient using the example of maternal-effect genes. 7
1. (B) Write a note on dorso-ventral patterning. 7

2. (A) What is the neural crest ? Why is it called the fourth germ layer ? 7
2. (B) Explain the development of the retina. 7

OR

2. (A) Describe a process of molecular induction responsible for the development of the nervous system. 7
2. (B) Explain the development and function of the spiral partition of the aorta in humans. 7

3. (A) Define regeneration and explain its types with relevant examples. 7
3. (B) Give an account of regeneration in different groups of invertebrates with appropriate examples. 7

OR

3. (A) Explain the role of chemical regulators in controlling the growth and development of animals. 7
3. (B) Differentiate between auxetic, multiplicative, and accretionary types of growth, giving examples. 7

4. (A) Discuss the therapeutic applications of bone marrow transplant. 7
4. (B) Give a note on FRET. 7

OR

4. (A) Write a short note on “how a protein is identified as a molecular medicine target”. 7
4. (B) Explain Morpholino, including its mechanism and applications. 7

5. Answer any **seven** out of **twelve** : 14

- (1) Write any four limitations of radioactive fate mapping ?
 - (2) What are vital dyes ? Why did Vogt use them in his experiment ?
 - (3) What are microtubule-associated motor proteins ? Give their exact functions.
 - (4) Differentiate between foramen primum and foramen secundum.
 - (5) Differentiate between the pronephros, mesonephros and metanephros.
 - (6) What is the ascent of the kidney ? What happens when it fails ?
 - (7) What histological modifications occur during the regeneration process in hydroid polyps ?
 - (8) How did Morgan prove that nutrition affects the regenerative ability of *Planaria lugubris* ? Describe the experiment and its results.
 - (9) What is the formula for calculating population size in exponential growth ? Determine the population from 4 individuals with a reproductive rate of 20 after three generations.
 - (10) Define : Euphenics
 - (11) Differentiate between Pharmacogenetics and Pharmacogenomics.
 - (12) What is Eteplirsen and its primary therapeutic use ?
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