

DEVELOPMENTAL BIOLOGY (MSCZO -602)

Block I: Developmental Biology

Unit 1: Concept of Developmental Biology

- 1.1 Objectives
- 1.2 Introduction
- 1.3 History of Development
- 1.3 Principal feature and patterns of development
 - 1.3.1 Coelom
 - 1.3.2 Segmentation
 - 1.3.3 Somites
 - 1.3.4 Diploblast
 - 1.3.5 Protostomes and Deuterostomes
- 1.5 Terminal Questions and Answers

Unit 2: Gamete and Fertilization

- 2.1 Objectives
- 2.2 Introduction
- 2.3 Ultra structure of Gamete
 - 2.3.1 Sperms
 - 2.3.2 Egg
- 2.4 Mechanism of Fertilization
 - 2.4.1 Pre Fertilization
 - 2.4.2 Post Fertilization
 - 2.4.3 Biochemistry of Fertilization
- 2.5 Summary
- 2.6 Terminal Questions and Answers

Unit 3: Cleavage, Blastulation and Gastrulation

- 3.1 Objectives
- 3.2 Introduction
- 3.3 Patterns of Cleavage
- 3.4 Determinate and Indeterminate Cleavage
- 3.5 Influence of Yolk on Cleavage
- 3.6 Metabolic Changes during Cleavage
- 3.7 Morulation and Blastulation in Frog, Chick and Rabbit
- 3.8 Types of Blastulae
- 3.9 Major events of Gastrulation and Fate maps
- 3.10 Morphogenetic movements in Frog, Chick and Rabbit
- 3.11 Significance of Gastrulation and Exogastrulation
- 3.12 Summary
- 3.13 Terminal Questions and Answers

Unit 4: Early Development

- 4.1 Objectives
- 4.2 Introduction
- 4.3 Neurulation and Ectoderm origin and fate of Neural Crest cells
 - 4.3.1 Neurulation
 - 4.3.2 Primary Neurulation
 - 4.3.3 Secondary Neurulation
- 4.4 Development of Mesoderm
- 4.5 Development of Endoderm
- 4.6 Summary
- 4.7 Terminal Questions and Answers

Block II:**Unit 5: Organogenesis and Organizer Concept**

- 5.1 Objectives
- 5.2 Introduction
- 5.3 Development of organs in Chick
 - 5.3.1 Brain, Eye and Heart
- 5.4 Embryonic induction
- 5.5 Primary organiser and its Morphological Differentiation
- 5.6 Origin of primary Organiser, Inductive Interactions
- 5.7 Nature of Inductive Signal (Possible mechanism of neural induction)
- 5.8 Competences
- 5.9 Summary
- 5.10 Terminal Question and Answers

Unit 6: Regeneration and Metaplasia

- 6.1 Objectives
- 6.2 Introduction
- 6.3 Distribution of Regenerative Ability
- 6.4 Polarity in Regeneration
- 6.5 Mechanism of regeneration of Amphibian limb and lens
- 6.6 Metaplasia
- 6.7 Super-regeneration and heteromorphosis
- 6.8 Summary
- 6.9 Terminal Questions and Answers

Unit 7: Metamorphosis

- 7.1 Objectives
- 7.2 Introduction
- 7.3 Kinds of Metamorphosis
- 7.4 Metamorphosis in Amphibia
- 7.5 Physiological and Biochemical changes during Metamorphosis
- 7.6 Hormonal control of Metamorphosis
- 7.7 Summary
- 7.8 Terminal Question and Answers

Unit 8: Teratogenesis

- 8.1 Objectives
- 8.2 Introduction
- 8.3 Types of teratogenesis
 - 8.3.1 Mechanisms of genetic and environmental teratogenesis
 - 8.3.2 Phenocopies
 - 8.3.3 Developmental mechanisms of teratogenesis
- 8.4 Summary
- 8.5 Terminal Questions and Answers