

**Department of Higher Education, Govt. of M.P.**

**Under Graduate Syllabus for B.Sc. (Bio) 3 years**

**As recommended by Central board of Studies in Zoology**

**B.Sc. I year**

**Subject : Zoology**

**Session 2020-21**

**Scheme of Examination**

<b>Paper</b>	<b>Topic of Paper</b>	<b>Theory</b>		<b>Internal Assessment</b>		<b>Total marks</b>
		<b>Max.Marks.</b>	<b>Min.Marks.</b>	<b>Quarterly Exam</b>	<b>Half yearly Exam</b>	
<b>I</b>	Invertebrates	40	13	10	10	<b>100</b>
<b>II</b>	Cell biology & Developmental Biology	40	13			
	Practical	50	17			<b>50</b>

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<b>Class</b>	- <b>B.Sc.I year (Session 2020-21)</b>
<b>Paper</b>	- <b>I</b>
<b>Subject</b>	- <b>Zoology</b>
<b>Title of Paper</b>	- <b>Invertebrates</b>
<b>Max. Marks:</b>	- <b>40</b>

**Unit-I**

1. Elementary Knowledge of Zoological Nomenclature and International Code.
2. Classification of Lower Invertebrates (According to Parker and Haswell 7<sup>th</sup> edition) upto Class.(i. Protozoa ii. Prorifera iii. Coelenterata iv. Platyhelminthes v. Nematelminthes )
3. Classification of Higher Invertebrates (According to Parker and Haswell 7<sup>th</sup> edition) upto Class(i. Annelida ii. Arthropoda iii. Mollusca iv. Echinodermata v. Hemichordata)

**Unit-II**

1. Protozoa- Type Study of Plasmodium.
2. Protozoa and Diseases wsr. Malaria, Amoebiasis, Trypanosomiasis and Leishmaniasis
3. Porifera- Type study of Sycon
4. Coelenterata- Type study of Obelia.
5. Corals and Coral Reef formation.

**Unit-III**

1. Helminthes- Type study of Liver Fluke (Fasciola hepatica)
2. Pathogenic symptoms of Nematodes and diseases– Ascariasis , Trichuriasis, Enterobiasis, Filariasis and Trichinosis
3. Annelida- Type study of Earthworm (Pheretima)
4. Coelom and Metamerism in Annelida
5. Structure and significance of Trochophore larva.

**Unit-IV**

1. Arthropoda- Type study of Prawn (Palaemon)
2. Larval forms of Crustacea wsr Nauplius ,Zoea, Megalopa and Mysis larva.
3. Different types of mouth parts in insects
4. Insect as Vectors of human diseases wsr. Culex, Aedes, Anopheles mosquito & Housefly.
5. Mollusca- Type study of Pila (An Apple Snail)

**Unit-V**

1. Echinodermata: External features and Water Vascular System of star fish (Asterias)
2. Life history of star fish.
3. Larval forms of Echinoderms
3. Hemichordata – Type study of Balanoglossus wsr External Features.
5. Development of Balanoglossus wsr structure and significance of Tornaria larva.
6. Affinities of Balanoglossus.

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<b>Class</b>	-	<b>B.Sc. Iyear (Session 2020-21)</b>
<b>Paper</b>	-	<b>II</b>
<b>Subject</b>	-	<b>Zoology</b>
<b>Title of Paper</b>	-	<b>Cell Biology and Developmental Biology</b>
<b>Max. Marks:</b>	-	<b>40</b>

**Unit-I**

1. History of Cell Biology, Cell Theory
- 2., Prokaryotic and Eukaryotic Cells.
3. Structure and function of Plasma Membrane
4. Structure and function of Golgi body, Endoplasmic Reticulum and Lysosomes.
5. Structure and function of Mitochondria, Ribosomes and Centriole.

**Unit-II**

1. Structure and function of Nucleus and Nucleolus.
2. Structure and function of Typical Chromosome.
3. Basic concept of Chromatin and Heterochromatin
4. Structure and Function of Lampbrush and Polytene Chromosome
5. Cell Cycle wr. Amitosis, Mitotic and Meiotic cell division.

**Unit-III**

1. Spermatogenesis in Vertebrates
2. Oogenesis in Vertebrates
3. Fertilization in Vertebrates
4. Parthenogenesis
5. Regeneration
6. Stem cells: Sources, types and their uses

**Unit-IV**

**Development of Frog**

1. Cleavage.
2. Blastulation
3. Fate map construction
4. Gastrulation upto formation of three germinal layers
5. Structure of Tadpole larva and its metamorphosis.

**Unit-V**

**Development of Chick**

1. Cleavage
2. Blastulation
3. Fate map construction
4. Gastrulation
5. Development of chick embryo upto formation of primitive streaks.
6. Extra embryonic membranes in chicks.

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;	<b>Class</b>	<b>B.Sc. I year (Session 2020-21)</b>
	<b>Subject</b>	<b>Zoology Practical</b>
	<b>Max. Marks:</b>	<b>50</b>

The Practical's work will be based on theory syllabus and the candidates will be required to show knowledge of the following -

1. Study of Museum Specimens and slides relevant to invertebrates studied in theory
2. Mounting (Temporary Mounting) /Comment upon whole mount
  - a) Prawn - Statocyst
  - b) Pila - Ctenidium / Radula/ Osphradium
  - c) Earthworm – Septal Nephridia
  - d) Mouth parts of insects
3. Dissection/ Demonstration  
Dissection of Cultured animals /Computer simulation technique/ Flag labeling on artificial model
  - a) Earthworm: Digestive System, Nervous System and Reproductive System.
  - b) Prawn: Nervous System, Appendages
  - c) Pila: Nervous System
4. Exercise related to Frog and Chick Embryology  
Study of Embryological slides / Permanent Mount
5. Exercise /spotting related to cell biology-
  - a) Identification of Mitochondria in buccal smear of cheek cells under Phase Contrast Microscope
  - b) Squash preparation of onion root tip
  - c) Identification of stages of mitotic and meiotic cell division through permanent slide.
  - d) Study of special types of chromosome through permanent slide.

**Distribution of Marks**

**Time: 3 hours**

**MM. 50**

1. Dissection	08
2. Spotting (8 spots)	16
3. Mounting /	06
4. Exercise related to Embryology	05
5. Exercise related to Cell Biology	05
6. Viva - Voce	05
7. Practical Record and Collection	05

## **B.Sc. I year – Zoology**

### **Books of M.P.Hindi Granth Academy**

1. Parker & Haswell : Textbook of Invertebrate Zoology
2. Kotpal R.L. : Invertebrate
3. Rastogi ,V.B. : Developmental Biology
4. Arora M.P. : Embryology
5. Verma P.S & Agrawal V.K. : Chordate Embryology
6. Karp : Cell and Molecular Biology
7. Sheelar & Bianchi : Cell and Molecular Biology
8. Rastogi ,V.B. : Introduction to Cytology
9. De Robertis : Cell and Molecular Biology
10. Powar C.B.: Cell Biology
11. Verma P.S & Agrawal V.K. : Cell Biology ,Genetics ,Molecular Biology& Evolution