B. Sc. III Semester

Z- 301. Paper I: Animal Diversity - III (Protochordata to Agnatha)

Z- 302. Paper II: Biochemistry and Immunology

Z- 303. Practical: Exercise based on papers I and II.
UNIT-I

1. Chordata: Primary chordate characters
2. Protochordata (invertebrate chordates), concept of invertebrate and nonchordates.
3. Salient features and outline classification of Protochordata.
4. Affinities of Protochordata.

UNIT-II

1. Hemichordata: General characters and classification up to class level.
2. *Balanoglossus*: Habit, habitat, external features, coelom, body wall, digestive, skeletal systems.
3. *Balanoglossus*: Circulatory, respiratory, excretory, nervous and sense organs, reproductive system, Tornaria larva.

UNIT-III

1. Urochordata: General characters and classification up to class level.
2. *Herdmania*: Habit, habitat, external features, general anatomy, body wall, digestive, skeletal systems.
3. *Herdmania*: Circulatory, respiratory, excretory, nervous and sense organs, reproductive system, Ascidian tadpole and its metamorphosis.
4. Affinities of Urochordata.

UNIT-IV

1. Cephalochordata: General characters and classification up to class level.
2. *Branchiostoma* (Amphioxus): Habit, habitat, external features, general anatomy, body wall, digestive, skeletal systems.
3. *Branchiostoma* (Amphioxus): Circulatory, respiratory, excretory, nervous and sense organs, reproductive system, larva.
4. Affinities of Cephalochordata.

UNIT- V
2. Living Agnatha – Cyclostomata: Classification up to class level and characters with suitable examples.

**Z-302. Paper II: Biochemistry and Immunology**

**Unit –I**

2. Structure of Carbohydrates, Protein, Lipids and Nucleic Acids.

**Unit - II**

1. Energy transfer, redox, cytochrome-system.
2. Enzyme: Nomenclature, classification, mechanism and specificity, enzyme activator, inhibitor, regulation and control of enzyme activity.

**Unit - III**

2. B and T cells. Lymphocytes: Helper, killer, memory and suppressor cells.

**Unit-IV**

1. Immune disorders and techniques: Basic idea of immune disorders.
2. Auto-immune diseases, AIDS, mechanism of HIV infection.
3. Monoclonal antibodies and their production, Applications of monoclonal antibodies; ELISA.

**Unit – V**
1. Vaccines and Transplants: Vaccination and immunization.
2. Vaccines; hepatitis vaccine, attenuation (oral polio vaccine), Antivenoms.
3. Organ transplants: Various types of transplant (allograft, xenograft, autograft), major histo-compatibility complex.

Z- 303. Practical: Exercise based on papers I and II

1. Study of animal diversity through museum specimens:-
Balanoglossus, Herdmania, Doliolum, Salpa, Oikopleura, Amphioxus, Petromzon, Myxine, Bdellostoma, ammocoete larva.

2. Study of sections of organs and developmental stages:
Hemichordata - T.S. through proboscis, collar and trunk regions of Balanoglossus, tornaria larva.
Urochordata : Pharyngeal wall, spicules and tadpole larva of Herdmania. Cephalochordata: T.S. of Branchiostoma through oral hood, pharynx, gonads and caudal region.

3. Dissections: Through Chart / Model / Photograph / CD
3. a. Major –
Balanoglossus – Coelome, digestive and nervous system.
Herdmania - general anatomy, digestive and respiratory systems.
Branchiostoma - general anatomy, digestive, reproductive and nervous system.
3. b. Minor –
Spicules and pharyngeal wall of Herdmania, W. M. of Branchiostoma.

4. Biochemistry
Qualitative estimation of --
(1) Protein (2) Fat (3) Carbohydrate (4) Catalase enzyme in animal tissue.

5. Immunology
(a) ELISA test (b) Elementary knowledge about Immunological tests.
**B.Sc. (Semester-III) - Zoology Practical Examination 2019**

**Distribution of Marks**

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<tr>
<th>Activity</th>
<th>Max. Marks</th>
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<tr>
<td>Time – 4hrs</td>
<td>50</td>
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<tr>
<td>1. Major Dissection - Through Chart / Model / Photograph / CD</td>
<td>05</td>
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<tr>
<td>2. Minor Dissection - Through Chart / Model / Photograph / CD</td>
<td>04</td>
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<tr>
<td>3. Slide Preparation</td>
<td>04</td>
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<tr>
<td>4. Biochemical exercise</td>
<td>04</td>
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<td>5. Immunological exercise</td>
<td>03</td>
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<td>6. Spots (10 X 2)</td>
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<td>7. Record</td>
<td>05</td>
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<td>10. Viva-voce</td>
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