

SH-II/SHZOO/201/C-3(T3)/18

**B.Sc. Semester-II (Honours) Examination, 2018**

**ZOOLOGY**

**Subject Code : 22601**

**Course Code : SH/ZOO/201/C-3(T3)**

**Course Title : Non-Chordates II**

**Time: 1 Hour 15 minutes**

**Full Marks: 25**

*The figures in the right hand side margin indicate marks.  
Candidates are required to give their answers in their own words  
as far as practicable.*

1. Answer *any five* questions: 1×5=5
- (a) What do you mean by eusocial insects?
  - (b) Define schizocoely.
  - (c) What is metanephridium?
  - (d) State the function of prothoracicotropic hormone (PTTH).
  - (e) What is Mosaic vision?
  - (f) Define metamerism.
  - (g) Mention two salient features of Phylum Onychophora.
  - (h) Write the names of two important ganglia of Gastropod nervous system.
2. Answer *any two* questions: 5×2=10
- (a) Define torsion in gastropods. Mention the advantages of torsion. What are flame cells and state its function. 1+2+2=5
  - (b) Write a short note on tracheal respiration in cockroach with proper diagram. 3+2=5
  - (c) State the salient characteristics of Phylum Arthropoda upto living class with examples. 4+1=5
  - (d) State any four general characteristics of Phylum Echinodermata with examples (Scientific names). 4+1=5
3. Answer *any one* question: 10×1=10
- (a) Describe the structure of a compound eye of an insect with suitable diagram. 7+3=10
  - (b) Mention the relationship of Hemichordata with non-chordates and chordates. State the salient features of Oligochaeta with examples. (3+3)+4=10
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SH-II/SHZOO/202/C-4(T4)/18

**B.Sc. Semester-II (Honours) Examination, 2018**  
**ZOOLOGY**

**Subject Code : 22602**

**Course Code : SH/ZOO/202/C-4(T4)**

**Course Title : Cell Biology**

**Time: 1 Hour 15 minutes**

**Full Marks: 25**

*The figures in the right hand side margin indicate marks.  
Candidates are required to give their answers in their own words  
as far as practicable.*

1. Answer *any five* questions: 1×5=5
  - (a) What is desmoplakin?
  - (b) State the function of MPF.
  - (c) Mention the role of peroxisome in animal cell.
  - (d) What is endosymbiosis?
  - (e) Differentiate between primary active transport and secondary active transport.
  - (f) What is the significance of metaphase checkpoint?
  - (g) What is chemiosmosis?
  - (h) What is membrane blebbing?
  
2. Answer *any two* questions: 5×2=10
  - (a) How CDK-Cyclins are responsible for promoting the transition of phases in a cell cycle? Explain your answer with suitable illustration. 3+2=5
  - (b) Differentiate between tight junction and gap junction. What is the symporter protein? Provide an example. What is GLUT 5? 2+2+1=5
  - (c) Describe the ultrastructure of Mitochondria with labelled diagram. What is the function of F<sub>0</sub>? 4+1=5
  - (d) Describe with suitable illustration the process of post translational translocation of a nascent polypeptide chain in Rough endoplasmic reticulum. 3+2=5
  
3. Answer *any one* of the following questions: 10×1=10
  - (a) How does formation of retinoblastoma support the Knudson's two hit model? "P<sup>53</sup> is the guardian of the genome"—Justify the statement. 5+5=10
  - (b) What makes a cell commit to suicide? State the characteristic features of an apoptotic cell. Briefly describe the extrinsic pathway of apoptosis with suitable illustration. 2+3+5=10
  - (c) Describe the ultrastructure of Plasma membrane with the help of Fluid Mosaic Model along with suitable illustration. 7+3=10

SH-II/SHZOO/203/GE-2(T3)/18

**B.Sc. Semester-II (Honours) Examination, 2018**  
**ZOOLOGY**

**Subject Code : 22603**

**Course Code : SH/ZOO/203/GE-2(T3)**

**Course Title : Aquatic Biology**

**Time: 1 Hour 15 minutes**

**Full Marks: 25**

*The figures in the right hand side margin indicate marks.  
Candidates are required to give their answers in their own words  
as far as practicable.*

1. Each question carry one mark. Answer *any five* questions: 1×5=5  
(প্রতিটি প্রশ্নের মান এক। যে-কোনো পাঁচটি প্রশ্নের উত্তর দাও।)
- (a) Why are Estuaries biologically important?  
(Estuaries -র জৈবনিক গুরুত্ব বলো।)
- (b) 'Lakes are Eutrophic in nature.'—Justify the statement.  
(‘হ্রদগুলি Eutrophic প্রকৃতির’—উক্তিটির ব্যাখ্যা করো।)
- (c) Define Atoll?  
(Atoll বলতে কী বোঝো?)
- (d) Mention the name and location of the largest coral reef in the world?  
(পৃথিবীর বৃহত্তম coral reef-টির নাম ও অবস্থান বল।)
- (e) Define Bioluminescence.  
(Bioluminescence বলতে কী বোঝো?)
- (f) What is Stone Cancer?  
(Stone Cancer কী?)
- (g) Give the full form of WWFN.  
(WWFN পুরো নামটি লেখো।)
- (h) What is Pelagic zone?  
(Pelagic zone কী?)
2. Each question carry five marks. Answer *any two* questions: 5×2=10  
(প্রতিটি প্রশ্নের মান পাঁচ। যে-কোনো দুটি প্রশ্নের উত্তর দাও।)
- (a) Mention the functions of wetland ecosystem. 2+3=5  
(Wetland ecosystem-এর কাজ উল্লেখ করো।)
- (b) What is Ozone Hole? Mention the controlling measures of Ozone Hole. 2+3=5  
(Ozone Hole কী? Ozone Hole নিয়ন্ত্রণ করার ব্যবস্থাপনাগুলি উল্লেখ করো।)

(c) Define Oceanic zone. Mention four major zones of oceans with suitable diagram. 2+3=5  
(Oceanic zone বলতে কী বোঝো? চার প্রকার Oceanic zone-র চিত্রসহ নাম লেখো।)

(d) Define Lake morphometry along with its importance. 2+2+1=5  
(Lake morphometry বলতে কী বোঝো ও ইহার গুরুত্ব আলোচনা করো।)

3. Each question carry ten marks. Answer *any one* question: 10×1=10  
(প্রতিটি প্রশ্নের মান দশ। যে-কোনো একটি প্রশ্নের উত্তর দাও।)

(a) Why are hill stream fishes more beautiful than low land water body fishes? Mention the morphological adaptations of hill stream fishes in regard to 2+(2×4)=10

(i) External body

(ii) Position of Mouth and Lip

(iii) Eyes and Fins

(iv) Adhesive apparatus

(Low land water body-তে বসবাসকারী মাছেদের চেয়ে hill stream-এ বসবাসকারী মাছগুলি বেশি সুন্দর হয় কেন? নিম্নলিখিত বৈশিষ্ট্যের ভিত্তিতে hill stream মাছেদের অঙ্গস্থানিক অভিযোজনজনিত পরিবর্তনগুলি বর্ণনা করো।)

(i) বহিরাকৃতি

(ii) মুখ এবং ঠোঁটের অবস্থান

(iii) চোখ এবং পাখনা

(iv) Adhesive apparatus

(b) Write short notes on: 2½×4=10  
(সংক্ষিপ্ত টীকা লেখোঃ)

(i) Biological magnification

(ii) Adaptive features of deep sea vertebrates

(Deep sea vertebrates-দের অভিযোজনজনিত বৈশিষ্ট্যাবলী)

(iii) Eutrophication

(iv) Sea weeds

**SP-II/SPZOO-201/C-1B/18**

**B.Sc. Semester-II (Programme) Examination, 2018**

**ZOOLOGY**

**Subject Code : 22604**

**Course Code : SP/ZOO/201/C-1B**

**Course Title : Ecology**

**Time: 1 Hour 15 Minutes**

**Full Marks: 25**

*The figures in the margin indicate full marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

1. *Five* questions are to be answered out of eight: 1×5=5  
আটটির মধ্যে পাঁচটি প্রশ্নের উত্তর দিতে হবে :
- (a) What do you mean by Autecology?  
অটইকোলজি বলতে কী বোঝো?
- (b) Define community dominance.  
জীবগোষ্ঠীতে প্রকটতা বা কমিউনিটি ডমিনেন্স-এর সংজ্ঞা দাও।
- (c) What is Thermocline?  
থার্মোক্লাইন কী?
- (d) Give definition of food web.  
খাদ্যজাল-এর সংজ্ঞা দাও।
- (e) What do you mean by population?  
পপুলেশন বলতে কী বোঝো?
- (f) What is cryopreservation?  
ক্রায়োসংরক্ষণ কী?
- (g) Give full form of IUCN.  
IUCN-এর পুরো নাম লেখো।
- (h) What is carrying capacity?  
ক্যারিং ক্যাপাসিটি বা বহনক্ষমতা কী?
2. *Two* questions are to be answered out of four: 5×2=10  
চারটির মধ্যে দুটি প্রশ্নের উত্তর দিতে হবে :
- (a) What is NPP? Give a comparative account of Linear food chain and Y shaped food chain. 1+4=5  
NPP কী? Linear খাদ্যশৃঙ্খল ও Y আকৃতির খাদ্যশৃঙ্খলের মধ্যে তুলনামূলক আলোচনা করো।

**BNK22604**

**Please Turn Over**

- (b) Define Ecological Succession. What do you mean by seral communities and climax stage? 1+2+2=5  
ইকোলজিক্যাল সাকসেসান-এর সংজ্ঞা দাও। সেরাল কমিউনিটি ও ক্লাইম্যাক্স স্টেজ বলতে কী বোঝো?
- (c) What do you mean by Human modified forest ecosystem? Distinguish between nitrification and denitrification. 2+3=5  
'Human modified forest ecosystem' বলতে কী বোঝো? নাইট্রিফিকেশন ও ডিনাইট্রিফিকেশন-এর মধ্যে পার্থক্য করো।
- (d) Define Species Diversity. Compare between  $r$  selected population and  $k$  selected population. 1+4=5  
'প্রজাতি বৈচিত্র্য'-এর সংজ্ঞা দাও। ' $r$  selected population' ও ' $k$  selected population'-এর তুলনা করো।
3. One question is to be answered out of two: 10×1=10  
দুটির মধ্যে একটি প্রশ্নের উত্তর দিতে হবে :
- (a) Discuss the Logistic and Exponential Growth Curve with figure. What do you mean by Density Dependent Factors and Density Independent Factors? 6+4=10  
চিত্রসহ 'Logistic' ও 'Exponential' পপুলেশন বৃদ্ধি-এর হার সম্পর্কিত curve সম্বন্ধে আলোচনা করো। ঘনত্ব-নির্ভর শর্ত ও ঘনত্ব-স্বাধীন শর্ত বলতে কী বোঝো?
- (b) Write a short note on Biosphere Reserve. State the differences between National Park and Sanctuary. Suggest some management strategies for Tiger conservation. 3+3+4=10  
'বায়োস্ফিয়ার রিজার্ভ' সম্বন্ধে সংক্ষিপ্ত টীকা লেখো। জাতীয় উদ্যান ও অভয়ারণ্য-র মধ্যে পার্থক্য লেখো। ব্যাঘ্র সংরক্ষণ সম্পর্কে কিছু ম্যানেজমেন্ট কৌশলের সুপারিশ করো।

SP-II/201/C-1B(PR)/18

**B.Sc. Semester-II (Programme) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22614**

**Course Code : 201/C-1B**

**Course Title : Ecology Lab**

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the right hand side margin indicate marks.*

1. Identify the given planktons (1A and 1B) with reasons. Mention at least two identifying characters. Write down the scientific names (Genus only) and systematic positions (Phylum and Class).  $(1+\frac{1}{2}+\frac{1}{2}+\frac{1}{2})\times 2=5$
  2. (a) Estimate the Dissolved oxygen content (Winkler's method) of the water sample provided.  
*Or,*  
(b) Determine the pH of the water sample provided. Write down the working principle, observations and results (including calculations) and infer your result.

|              |   |
|--------------|---|
| Principle    | 1 |
| Observations | 3 |
| Result       | 1 |
| Inference    | 1 |
  3. Submission of report on a visit to a National Park/Biodiversity Park/ Wildlife Sanctuary.

|                                  |   |
|----------------------------------|---|
| <i>Viva voce</i>                 | 2 |
| Hard copy of the original report | 2 |
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**B.Sc. Semester-II (Honours) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22614**

**Course Code : 201/C-1B**

**Course Title : Ecology Lab**

*Instructions to the Examiners*

1. For question no. 1, examiners are requested to select any two planktons (preferably one from phytoplankton and one from zooplankton), IA and IB for identification. Candidate must write at least two identifying characters.
2. A key to the identifications of specimens has to be prepared and duly signed by the examiners for each batch of candidates and should be enclosed along with the evaluated answer-scripts. It should be sent to the Convener within 5 days after completion of examination.
3. For question no. 2, examiners are requested to set any one experiment (2a or 2b) for the candidates of each batch. The combination for each batch should be clearly mentioned in the sheet containing the answer keys and duly signed by the examiners.
4. No marks should be awarded for writing common name of specimen/spelling mistakes/writing technical/scientific terms in other than English.
5. For question no. 3, *Viva voce*, the examiners are requested to ask questions exclusively based on the report submitted for the visit as mentioned in the syllabus. Examiners are requested to ask at least four questions from the submitted report.
6. For any discrepancy/anomaly/query, examiners are requested to contact the concerned convener on urgent basis.
7. On completion of the evaluation process the answer-scripts are to be enclosed in packets with top sheet containing details of the examiner.
8. A separate sheet containing names, designation, mobile number, specimen signature and address of the examiners should be enclosed along with the answer-scripts.
9. Award list should be enclosed in a separate packet and sealed.
10. The packet containing award list, details of the examiners and the answer-script should be put in a packet and sealed either sent by registered post or through messenger to the convener.



**SH-II/SHZOO/201/C-3(P3)(PR)/18**

**B.Sc. Semester-II (Honours) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22611**

**Course Code : SH/ZOO/201/C-3(P3)**

**Course Title : Non-Chordates II Lab**

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the right hand side margin indicate marks.*

1. Identify the specimens (A, B & C) with reasons. ( $\frac{1}{2}+1\frac{1}{2}$ ) $\times$ 3=6
  2. Dissect out the specimen provided. Draw a labelled diagram of the same. (2+1)=3
  3. Identify the given transverse section. Write the characteristic features of the same. ( $\frac{1}{2}+1$ )=1 $\frac{1}{2}$
  4. Prepare a temporary Mount of the specimen provided. 1 $\frac{1}{2}$
  5. Submission of laboratory notebook and a project report. (1+2)=3
-

**B.Sc. Semester-II (Honours) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22611**

**Course Code : SH/ZOO/201/C-3(P3)**

**Course Title : Non Chordates II Lab**

*Instructions to the Examiners*

1. Necessary arrangements may please be made before the date of commencement of practical examinations.
2. For question no. 1, three specimens are to be selected taking one from arthropods, one from annelids and one from echinoderms/molluscs.  
For specimens, scientific name and characters are to be mentioned.  
For question no. 1, separate loose sheets should be supplied to the candidates in the identification hall and should be collected within schedule time.  
The loose sheets are to be attached with the main answer-scripts after evaluation and duly signed by the examiner.
3. For question no. 2, one dissection from the following may be allotted:  
(a) Digestive system of earthworm  
(b) Septal nephridia of earthworm  
Please write the selected dissection for the students on the blackboard kept in the laboratory.  
Instruct the examinees to write the allotted dissection of the first right page of the answer-script and should be duly signed by the examiner.  
Examinees have to draw the labelled diagram of the dissection.
4. For question no. 3, examinees have to identify the given transverse section. The examinees have to write the identifying features of the same.
5. For question no 4, examinees will mount the selected part(s)/system of the specimen provided. Credits should be given for proper arrangement of the selected part or proper display of the specimen.  
Please write the question no. 4 on the blackboard kept in the laboratory.  
Instruct the examinees to write the allotted mounting of the first right page of the answer-script and should be duly signed by the examiner.
6. During assessment of laboratory notebook please extend credit to the items of the syllabus covered by the candidate and signed regularly so that distinction can be offered to the deserving candidates. Regarding personal activity that is submission of project report as mentioned in question no. 5, please extend credit to the signed copies only.

7. Only the examiner and laboratory personnels should be allowed to enter the laboratory during examination.
  8. Full name and signature together with address of the examiners should be enclosed with the answer-scripts.
  9. After completion of examination the answer-scripts should be enclosed in a sealed packet containing top sheet. Award list should be separately submitted.
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**SH-II/SHZOO/202/C-4(P4)(PR)/18**

**B.Sc. Semester-II (Honours) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22612**

**Course Code : SH/ZOO/202/C-4(P4)**

**Course Title : Cell Biology Lab**

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the right hand side margin indicate marks.*

1. Identify the mitotic stage from the supplied permanent slide. Write the identifying characters of the stage as per instruction.

|                |   |
|----------------|---|
| Identification | 1 |
| Characters     | 2 |
  
  2. Prepare a temporary stained slide with the Grasshopper Testis. Show and identify any mitotic stage. Draw a labelled diagram of that stage.

|                    |   |
|--------------------|---|
| Squash preparation | 2 |
| Identification     | 1 |
| Drawing            | 2 |
| Labelling          | 1 |
  
  3. Stain the supplied specimen using Feulgen reaction and comment on the reaction.

|             |   |
|-------------|---|
| Preparation | 2 |
| Stain       | 3 |
| Comment     | 1 |
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**B.Sc. Semester-II (Honours) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22612**

**Course Code : SH/ZOO/202/C-4(P4)**

**Course Title : Cell Biology Lab**

*Instructions to the Examiners*

1. The examiners are requested to make the necessary arrangements before the date of commencement of Practical examination.
2. For question no. 1, examiners are requested to instruct the examinee to collect the supplied specimen and squash the material for further procedure.
3. For question no. 2, examinee will be asked to prepare a specific slide from the grasshopper testis slide and should show it to any examiner and write at least 4 characters for that stage.
4. For question no. 3, examiners are requested to supply slide which is prepared for Feulgen reaction, to the examinee.
5. For question no. 1 and 3, marked slides are to be provided to the examinee.
6. Examiners are requested to send the following items within 7 days after the completion of the examination as per university instructions.
  - (a) Examiners "Datasheet" containing names, specimen signature, address and phone number of all the examiners.
  - (b) Answer-script of the candidate under sealed cover.
  - (c) Key for Questions No. 1 and 2.
  - (d) Award list.

SH-II/SHZOO/203/GE-2(P3)(PR)/18

**B.Sc. Semester-II (Honours) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22613**

**Course Code : SH/ZOO/203/GE-2(P3)**

**Course Title : Aquatic Biology Lab**

**Time: 2 Hours**

**Full Marks: 15**

*The figures in the right hand side margin indicate marks.*

*Answer all questions.*

1. Identify the two given specimens present in a lake ecosystem (1A and 1B)  
Identifying characters (at least two) ( $\frac{1}{2} + \frac{1}{2}$ ) $\times$ 2=2  
Genus:  $\frac{1}{2} \times 2 = 1$   
Phylum:  $\frac{1}{2} \times 2 = 1$   
Class/family:  $\frac{1}{2} \times 2 = 1$
  
  2. Determine the (a) amount of dissolved oxygen or (b) free carbon-dioxide, in a given water sample collected from a nearby water body and write the working principle. Mention the principle, observation and result and infer the result.  
Principle 1  
Observation and Result 2+1=3  
Inference 1
  
  3. Identify the given instrument used in limnology and write one of its use and significance.  
Identification 1  
Use  $\frac{1}{2}$   
Significance  $\frac{1}{2}$
  
  4. Submission of project report on a visit to a sewage treatment plant/marine bio-reserve/Fisheries institute.  
*Viva voce* on project report 1  
Project report 2
-

**B.Sc. Semester-II (Honours) Practical Examination, 2018**

**ZOOLOGY**

**Subject Code : 22613**

**Course Code : SH/ZOO/203/GE-2(P3)**

**Course Title : Aquatic Biology Lab**

*Instructions to the Examiners*

1. For question no. 1, examiners are requested to select any two specimens (1A and 1B) from macrophytes, phytoplanktons and zooplanktons present in a lake ecosystem for identification.
2. A key to the identification of the specimens (1A and 1B) has to be prepared and duly signed by the examiners for each batch and should be enclosed along with the evaluated answer-scripts. It should be sent to the convener within 5 days after completion of the examination.
3. No-mark should be awarded for writing common name of specimen/spelling mistakes/writing technical/scientific terms in other than English.
4. For question no. 2, any one experiment (2a or 2b) has to be given to the examinees and the combination should be clearly mentioned in the answer key for each set.
5. For *viva voce* of question no. 4, the examiners are requested to ask questions exclusively based on the project report submitted by the examinees. Examiners have to ask at least three questions from the project report.
6. For question no. 3, the examiners are requested to give any one instrument (Secchi disc/Van Dorn bottle/Conductivity meter/Turbidity meter/PONAR grab samples) used in limnology to the examinees. The examinees must identify the instrument and then write at least any one of its uses and significance.