



WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2022

ZOOADSE05T-ZOOLOGY (DSE3/4)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
Candidates should answer in their own words and adhere to the word limit as practicable.
All symbols are of usual significance.*

1. Answer any **eight** questions from the following: 2×8 = 16
- (a) What is “ring stage”?
 - (b) Differentiate parasitism and commensalism with example.
 - (c) What is a hyperparasite?
 - (d) Who serve as the definitive and intermediate hosts of *Leishmania donovani*?
 - (e) Compare mechanical and biological vectors with suitable examples.
 - (f) What is measles?
 - (g) How do the *Schistosomes* differ from other *trematodes*?
 - (h) What is zoonosis?
 - (i) What is Loeffler’s syndrome?
 - (j) What do you mean by definitive host?
 - (k) Write two medical importance of *Pediculus Humanus*.
 - (l) Write the difference between taeniasis and cysticercosis.
2. Answer any **three** questions from the following: 3×3 = 9
- (a) What are the differences between male and female *Ascaris lumbricoides* (on the basis of morphological features)?
 - (b) Differentiate between erythrocytic and exo-erythrocytic schizogony.
 - (c) Describe with a diagram, the structure of scolex in *Taenia solium*.
 - (d) What is neurocysticercosis in human being?
 - (e) Write a short note on ‘root-knot nematode’.
3. Answer any **three** questions from the following: 5×3 = 15
- (a) Name the parasite and its secondary host that causes urinary schistosomiasis. Why fascioliasis is considered as a global emerging disease? 2+3
 - (b) Draw and describe the life cycle of *Wuchereria bancrofti*.
 - (c) Describe the pathogenicity of the disease caused by *Entamoeba histolytica*. Why the parasite is so named? 3+2
 - (d) Briefly describe host parasite relationship in the following given features listed below: 2½ + 2½
 - (i) Parasitic castration
 - (ii) Types of host cell degeneration.
 - (e) Distinguish between hard tick and soft tick. Compare their disease potential. 2+3

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WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2022

ZOOADSE04T-ZOOLOGY (DSE3/4)

FISH AND FISHERY

Time Allotted: 2 Hours

Full Marks: 40

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1. Answer any **eight** questions from the following: 2×8 = 16
- (a) What are the roles of mahua oil cake in aquaculture?
- (b) What is Catamaran?
- (c) Name two fishes exhibiting bioluminescence.
- (d) Distinguish between pelagic and demersal fishery.
- (e) What is ductus pneumaticus?
- (f) Write the name of causative agent and symptoms of 'gill rot' disease. 1+1
- (g) How would you determine the sex of male and female carp during induced breeding?
- (h) What is stripping?
- (i) What is gas bubble disease?
- (j) Define SMGT method.
- (k) What do you mean by anadromous fish? Give Indian example. 1+1
- (l) Mention the difference between Breeding Hapa and Hatching Hapa.
- (m) What do you mean by Active and Passive Gear?
- (n) What is Ovaprim? Mention its advantages. 1+1
2. Answer any **three** questions from the following: 3×3 = 9
- (a) What is Pen Culture? Write its merits and demerits. 1½ + 1½
- (b) Distinguish between extensive, semi-intensive and intensive fish culture. 3
- (c) Write in brief about glass jar hatchery. Which one is superior glass jar hatchery or eco hatchery? 2+1
- (d) Write a short note on EEZ. 3
- (e) Describe different types of fish scales with examples. 3

3. Answer any *three* questions from the following: 5×3 = 15
- (a) Write about pre-stocking management adopted in composite fish culture. 5
- (b) What do you mean by transgenic fish? What is your opinion about introduction of transgenic fish in aquaculture? 2+3
- (c) Draw and describe two types of gears and two types of crafts used commonly in fishing in India. $2\frac{1}{2} + 2\frac{1}{2}$
- (d) Classify fishes (up to subclass) with characters and example of each living taxon. 5
- (e) What is the basic principle of induced breeding? Discuss the advantages of this technique. Briefly state the factors affecting successful induced breeding. 1+2+2

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2022

ZOOACOR13T-ZOOLOGY (CC13)

DEVELOPMENTAL BIOLOGY

Time Allotted: 2 Hours

Full Marks: 40

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1. Answer any **eight** questions from the following: 2×8 = 16
- (a) Differentiate between holoblastic and meroblastic cleavage.
 - (b) State the function of Resact.
 - (c) What is the effect of Thalidomide on the embryo?
 - (d) What are radial and spiral cleavage? Give examples.
 - (e) What do you mean by Primary Organizer?
 - (f) What is Acrosome reaction?
 - (g) How epiblast and hypoblast are formed in avian gastrulation?
 - (h) What is Trophoblast?
 - (i) Why amniocentesis is done during pregnancy?
 - (j) What do you mean by haemo-chorial and endothelio-chorial placenta?
 - (k) What is the function of Zona Pellucida?
 - (l) What is Mid Blastula Transition (MBT)?
2. Answer any **three** questions from the following: 3×3 = 9
- (a) What is the fast block of Polyspermy? Explain.
 - (b) What do you mean by fertilization cone? How is it formed?
 - (c) State the prerequisite of IVF.
 - (d) Write short notes on: (any **one**)
 - (i) Cortical reaction
 - (ii) Capacitation
 - (iii) Egg-Sperm recognition.
 - (e) Classify placenta on the basis of maternal and fetal attachment.

3. Answer any *three* questions from the following: 5×3 = 15
- (a) Differentiate between Spermatogenesis and Oogenesis.
 - (b) Briefly describe the steps of neurulation and formation of brain with suitable diagram.
 - (c) Briefly describe an experiment showing inducing power of early and late gastrula in newt embryo.
 - (d) Describe spermiogenesis. What are the functions of Sertoli Cells? 2+3
 - (e) Briefly describe (with suitable diagram) the process of primitive streak formation in chick.

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WEST BENGAL STATE UNIVERSITY
B.Sc. Programme 6th Semester Examination, 2022

ZOOGDSE03T-ZOOLOGY (DSE2)

Time Allotted: 2 Hours

Full Marks: 40

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1. Answer any **eight** questions from the following: 2×8 = 16
নিম্নলিখিত যে-কোনো **আটটি** প্রশ্নের উত্তর দাওঃ
- (a) What do you mean by marsh?
মার্স কাকে বলা হয় ?
- (b) Write four characteristics of benthic region.
বেস্থিক অঞ্চলের চারটি বৈশিষ্ট্য লেখো।
- (c) Define sewage and sludge.
সিউয়েজ এবং স্লাজ-এর সংজ্ঞা দাও।
- (d) Write two adaptations found in deep sea fishes.
গভীর সমুদ্রে বসবাসকারী মাছেদের দুটি অভিযোজন লেখো।
- (e) Write four characteristics of estuary.
মোহনার চারটি বৈশিষ্ট্য লেখো।
- (f) Write the scientific name of two marine benthic organisms.
দুটি সামুদ্রিক বেনথিক জীবের বৈজ্ঞানিক নাম লেখো।
- (g) What is oxidation pond?
জরন পুকুর কাকে বলে ?
- (h) How does turbidity affect lake quality?
জলের অস্বচ্ছতা কিভাবে হ্রদের গুণগত মানকে প্রভাবিত করে ?
- (i) Write the definition of succession.
সাক্ষেশনের সংজ্ঞা লেখো।
- (j) What is oil spill? Mention its adverse effect.
অয়েল স্পিল কী ? এর ক্ষতিকারক প্রভাব লেখো।
- (k) Write the scientific names of two coral organisms.
দুটি কোরালের বিজ্ঞানসম্মত নাম লেখো।
- (l) How does salinity affect dissolved oxygen?
জলের লবণাক্ততা কিভাবে দ্রবীভূত অক্সিজেনকে প্রভাবিত করে ?

2. Answer any **three** questions from the following: 3×3 = 9
নিম্নলিখিত যে-কোনো **তিনটি** প্রশ্নের উত্তর দাওঃ
- (a) What are the causes of coral bleaching? How does it affect humans? 2+1 = 3
কোরাল ব্লিচিং-এর কারণগুলি কী কী ? এটা কিভাবে মানুষকে প্রভাবিত করে ?
- (b) Write three uses of fly ash. 3
ফ্লাই-অ্যাস-এর তিনটি ব্যবহার লেখো।
- (c) Write three harmful effect of Agricultural pollution. 3
কৃষিজ দূষণ এর তিনটি ক্ষতিকারক প্রভাব সম্পর্কে লেখো।
- (d) Write the names and two features of different stages found in stream.
জলপ্রবাহের বিভিন্ন ধাপগুলির নাম এবং দুটি বৈশিষ্ট্য লেখো।
- (e) Write in brief about the migration of full stream fishes.
পার্বত্য নদীতে বসবাসকারী মাছের পরিযান সম্পর্কে সংক্ষেপে লেখো।
3. Answer any **three** questions from the following: 5×3 = 15
নিম্নলিখিত যে-কোনো **তিনটি** প্রশ্নের উত্তর দাওঃ
- (a) Write down the types of industrial wastes with examples. Write the advantages of using activated sludge. 2½+2½ = 5
শিল্পজাত বর্জ্যের প্রকারগুলি উদাহরণসহ লেখো। সক্রিয় কাদা ব্যবহারের সুবিধা কী ?
- (b) What is the significance of oxygen and carbon dioxide as physiochemical parameter? What are the effects of industrial pollution? 3+2 = 5
অক্সিজেন এবং কার্বন ডাই-অক্সাইডের ভৌত-রাসায়নিক উপাদান হিসাবে গুরুত্ব কী ? শিল্পজাত দূষণের প্রভাবগুলি কী ?
- (c) How many types of lakes are classified on the basis of their productivity? Describe briefly each type. What is coral lake? 1+3+1 = 5
উৎপাদনশীলতা অনুসারে হ্রদকে কিভাবে শ্রেণীবিন্যাস করা হয় ? প্রত্যেক প্রকারের সংক্ষিপ্ত বিবরণ দাও। কোরাল হ্রদ কি ?
- (d) Write in brief about the biomass of marine benthic zone. 5
সামুদ্রিক বেন্থিক জোন-এর জীবগোষ্ঠী সংক্ষেপে লেখো।
- (e) What is thermal pollution? Mention its adverse effect. 1+4 = 5
থার্মাল দূষণ কী ? এর ক্ষতিকারক প্রভাব উল্লেখ করো।

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WEST BENGAL STATE UNIVERSITY
B.Sc. Programme 6th Semester Examination, 2022

ZOOGDSE04T-ZOOLOGY (DSE2)

IMMUNOLOGY

Time Allotted: 2 Hours

Full Marks: 40

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Candidates should answer in their own words and adhere to the word limit as practicable.*

1. Answer any **eight** questions from the following: 2×8 = 16
নিম্নলিখিত যে-কোনো **আটটি** প্রশ্নের উত্তর দাওঃ
- (a) What is passive immunity?
পরোক্ষ অনাক্রম্যতা কি ?
- (b) Define haptén.
হ্যাপটেন কাকে বলে ?
- (c) What are cytokines? Give examples.
সাইটোকাইন কাকে বলে ? উদাহরণ দাও।
- (d) What is DNA vaccine?
DNA ভ্যাক্সিন কি ?
- (e) What is partial antigen?
অসম্পূর্ণ অ্যান্টিজেন কি ?
- (f) What is the function of Membrane Attack Complex?
মেমব্রেন অ্যাটাক কমপ্লেক্সের কাজ লেখো।
- (g) What is epitope?
এপিটোপ কাকে বলে ?
- (h) Distinguish between MHC I and MHC II.
MHC I ও MHC II-এর মধ্যে পার্থক্য লেখো।
- (i) What is macrophage?
ম্যাক্রোফাজ কি ?
- (j) Differentiate between LD₅₀ and LC₅₀.
LD₅₀ এবং LC₅₀-এর মধ্যে পার্থক্য লেখো।
- (k) What do you mean by antibody dependent cytotoxicity?
অ্যান্টিবডি নির্ভর সাইটোটক্সিসিটি কাকে বলে ?
- (l) What is agglutination?
অ্যাগ্লুটিনেশন কি ?

2. Answer any **three** questions from the following: 3×3 = 9
নিম্নলিখিত যে-কোনো **তিনটি** প্রশ্নের উত্তর দাওঃ
- (a) Explain the structure of T cell receptor with a labelled diagram.
লেবেলযুক্ত চিত্রসহকারে T সেল রিসেপ্টরের গঠন বর্ণনা করো।
- (b) Distinguish between exogenous and endogenous pathway of antigen presentation.
অ্যান্টিজেন প্রদর্শনের ক্ষেত্রে এক্সোজেনাস ও এন্ডোজেনাস পদ্ধতির মধ্যে পার্থক্য লেখো।
- (c) Write the principle of vaccination.
ভ্যাক্সিনেশনের নীতি লেখো।
- (d) What are the differences between an immunogen and an antigen?
ইম্যুনোজেন ও অ্যান্টিজেনের মধ্যে পার্থক্য কি ?
- (e) Draw a detailed structure of any antibody.
যে-কোনো একটি অ্যান্টিবডি'র বিস্তারিত গঠনের চিত্র আঁকো।
3. Answer any **three** questions from the following: 5×3 = 15
নিম্নলিখিত যে-কোনো **তিনটি** প্রশ্নের উত্তর লেখোঃ
- (a) What is innate immunity? Describe the innate defence mechanism. 1+4 = 5
সহজাত অনাক্রম্যতা কি ? সহজাত প্রতিরক্ষা ব্যবস্থার বর্ণনা দাও।
- (b) What is complement system? What are the main components and functions of complement system? 2+3 = 5
কমপ্লিমেন্ট সিস্টেম কি ? কমপ্লিমেন্ট সিস্টেমের প্রধান উপাদান ও তাদের কর্মের বর্ণনা দাও।
- (c) What are the differences between B cells and T cells? 5
B কোষ ও T কোষের মধ্যে পার্থক্যগুলি লেখো।
- (d) What is autoimmune disease? Briefly describe any autoimmune disease. 2+3 = 5
অটোইমিউন রোগ কি ? যে-কোনো একপ্রকার অটোইমিউন রোগের সংক্ষিপ্ত বর্ণনা দাও।
- (e) What is vaccination? Give an account of the types and importance of vaccines. 1+4 = 5
ভ্যাক্সিনেশন কি ? ভ্যাক্সিনের বিভিন্ন প্রকার ও তাদের গুরুত্বের বিবরণ দাও।

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2022

ZOOACOR14T-ZOOLOGY (CC14)

Time Allotted: 2 Hours

Full Marks: 40

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1. Answer any **eight** questions from the following: 2×8 = 16
- (a) Define natural selection.
 - (b) What is ring species?
 - (c) What is bottleneck phenomenon?
 - (d) Distinguish between microevolution and macroevolution.
 - (e) What is 'Cambrian Explosion'?
 - (f) Write two characteristics of *Homo habilis*.
 - (g) Define cline and race.
 - (h) What is neo-Darwinism?
 - (i) What is genetic drift? Who proposed this theory?
 - (j) What is molecular clock?
 - (k) Distinguish between orthologous genes and paralogous genes with examples.
 - (l) Who are called 'hominins'?
2. Answer any **three** questions from the following: 3×3 = 9
- (a) Write down the Hardy Weinberg principle. Mention the factors on which this principle depends. 1+2
 - (b) Briefly explain allopatric speciation. What is 'incipient species'?
 - (c) Differentiate between analogous and homologous organs with examples.
 - (d) Make a comparison among the three domains of life.
 - (e) Comment on the evolution in vertebrate globin genes.
 - (f) Write a short note on the dating of fossils.
3. Answer any **three** questions from the following: 5×3 = 15
- (a) How fossils are formed? What are the different types of fossils? 2+3
 - (b) Write in brief about the pre-mating isolating mechanisms. 5

- (c) Describe disrupting, stabilizing and directional selection with examples. 5
- (d) Write a short note on adaptive radiation with suitable example. Give examples of adaptive convergence each from placental and marsupial mammal groups. 3+2
- (e) What advantages did Bipedalism offered to early hominids? Comment on the theory of use and disuse. 3+2
- (f) What do you mean by panmixis? The number of heterozygous individuals in a population is eight times greater than the number of homozygous recessives. What are the frequencies of the recessive allele? 1+4

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2022

ZOOADSE06T-ZOOLOGY (DSE3/4)

Time Allotted: 2 Hours

Full Marks: 40

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1. Answer any **eight** questions from the following: 2×8 = 16
- (a) Where would you find coniferous forest and mangrove forest in West Bengal?
 - (b) Write the full forms of GPS and GIS.
 - (c) Name two wildlife sanctuaries of West Bengal.
 - (d) Give the full forms of CITES and IUCN.
 - (e) What is meant by 'habitat improvement zone' for a biosphere reserve?
 - (f) Why is the mangroves called 'osmotic desert'? Name two major plant species of the mangroves of West Bengal.
 - (g) Why the population of white-rumped vulture has been reduced?
 - (h) What is Cryopreservation?
 - (i) What is Red Data Book? Mention its importance.
 - (j) Give scientific names of two endangered mammals from West Bengal.
 - (k) What is Flagship species? Give an example.
 - (l) Name two National Parks in West Bengal where one-horned Rhinoceros are found.
2. Answer any **three** questions from the following: 3×3 = 9
- (a) Write a note on human-leopard conflict in the Northern West Bengal.
 - (b) Discuss the application of captive breeding in Species Conservation.
 - (c) Differentiate between *In Situ* and *Ex Situ* Conservation.
 - (d) Write briefly on the functions of National Board of Wildlife in accordance to WPA (1972).
 - (e) Differentiate between Schedule I and Schedule II animals under WPA (1972) with suitable examples.

3. Answer any *three* questions from the following: 5×3 = 15
- (a) Enumerate the role of NTCA to conserve tigers in India. How is Buxa rejuvenated as a tiger habitat? 3+2
- (b) What is edge effect? How does it affect the structure of a wilderness reserve? Mention two measures adopted to mitigate human-elephant conflict in the western part of the West Bengal. 1+2+2
- (c) What is geostationary satellite? Discuss, how forest cover changes may be monitored by Remote Sensing and GIS. 2+3
- (d) Justify, how anthropogenic activities lead to depletion of wildlife globally.
- (e) What are the advantages and disadvantages of wildlife tourism?

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