



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2024

ZOOACOR13T-ZOOLOGY (CC13)

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.*

2×8 = 16

1. Answer any **eight** questions from the following:

- What is fate map?
- State the role of resact molecule in sea urchin during fertilization.
- Distinguish between morphallaxis and epimorphosis.
- State the difference between holoblastic and meroblastic cleavage.
- What is capacitation?
- Name two teratogens.
- What is the function of trophectoderm cells?
- Make distinction between endotheliochorial and haemoendothelial placenta.
- What is regeneration blastema?
- What is primary organizer? Give an example.
- What is fertilization membrane?
- What are anterior and posterior neuropore?

3×3 = 9

2. Answer any **three** questions from the following:

- Describe the fast block to polyspermy in sea urchin.
- State an experiment that proves that dorsal lip of blastopore acts as inducer.
- Describe briefly the techniques involved in IVF (In Vitro Fertilization).
- Explain the major events involved in the process of spermatogenesis.
- Mention Karl Ernst von Baer's Laws. What do you understand by neural induction?

2+1

3. Answer any **three** questions from the following:

- Classify placenta based on the degree of association of foetal and maternal tissues.
(State the importance of stem cell.)
- Give a schematic diagram showing fate of germ layers in chick. Distinguish between area opaca and area pellucida.
- Describe the process of formation of brain in vertebrates with suitable diagram.
- State the gastrulation process of amphibians. What are the first kind of cells that enter inside during gastrulation in chick?
- Give the role of organizer in the development of eye in vertebrates. State the role of noggin, chordin and follistatin in embryogenesis.

5×3 = 15

3+2

3+2

4+1

2+3



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2024

ZOOACOR14T-ZOOLOGY (CC14)

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 radioactive clock method? 1+1
- (b) What is Sewall Wright effect? 1+1
- (c) What are molds and casts? 1+1
- (d) Define cline and race. 1+1
- (e) What is mass extinction? When did the last mass extinction occur? 1+1
- (f) What is Cambrian explosion? 1+1
- (g) What do you mean by 'connecting link'? Give example. 1+1
- (h) Define homology with proper example. 1+1
- (i) What are the driving agents of evolution? 1+1
- (j) Name the era known for 'Age of fish' and 'Age of Reptiles'. What is K-T boundary? 1+1
- (k) What is hot dilute soup? 1+1
- (l) Distinguish between microevolution and macroevolution. 1+1
- (m) What are 'Microspheres'? Who coined the term? 1+1
2. Answer any **three** questions from the following: 3×3 = 9
- (a) Differentiate between man and ape. 2+1
- (b) Briefly explain the population bottleneck phenomenon with suitable example. 2+1
- (c) What is biological species concept? State its drawbacks. 2+1
- (d) State two post mating isolating mechanisms with example. 1½ + 1½
- (e) One hundred students of a college were tested for their MN blood types and the following blood types were obtained: 2+1
- MM- 50, MN- 20, NN- 30 individuals. Calculate the gene frequency of M and N. Is the population in Hardy-Weinberg equilibrium?



3. Answer any *three* questions from the following:

(a) Define natural selection. Describe disrupting, stabilising and directional selection with appropriate examples.

(b) What is geological time scale? Explain with reasons which one is likely to occur faster in the evolutionary time scale-speciation or extinction.

(c) Write short notes on:

(i) Industrial melanism

(ii) Ethological isolating mechanism.

(d) What is molecular clock? 'Globin genes are molecular proof to vertebrate evolution' — Explain.

(e) Write two salient features of Java man. State the arguments favouring RNA be the first nucleic acid.

2½+2½

1+4

2+3

—x—

सक्षय विद्यमानम्
WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2024

ZOOADSE05T-ZOOLOGY (DSE3/4)



Full Marks: 40

Time Allotted: 2 Hours

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 brood parasitism? Cite an example.

(b) Define Zoonoses.

(c) What do you mean by reservoir host?

(d) What are the pathological effects produced by migrating Larvae of *Ascaris lumbricoides*?

(e) What is 'signet ring'? When and where is it found?

(f) Name the infective forms of *Plasmodium* and *Entamoeba*.

(g) Distinguish between facultative and obligatory parasite.

(h) Name two diseases and its causative agents transmitted by tick.

(i) What is gynaecophoric canal? What is schistosomulum?

(j) What is Cat Scratch Disease (CSD)?

(k) What is bubonic plague?

(l) Write the scientific name and two characteristic features of Candiru.

2. Answer any **three** questions from the following:

3×3 = 9

(a) What are intestinal and extraintestinal amoebiasis?

$1\frac{1}{2} + 1\frac{1}{2}$

(b) How do lung flukes infect man? What is Swimmer's itch?

2+1

(c) What are the different morphological forms of *Toxoplasma gondii*? What is congenital toxoplasmosis?

$1\frac{1}{2} + 1\frac{1}{2}$

(d) Write down the differences between soft tick and hard tick.

3

(e) Compare the amastigote and promastigote form of *Leishmania donovani*.

3

sinophil

3. Answer any **three** questions from the following:



(a) What is host parasite interaction mean? Discuss about parasitic castration.

(b) Write a note on distribution and feeding habit of Vampire bat.

(c) Describe the exoerythrocytic cycle of *Plasmodium vivax*. What is relapse in malaria? Define exflagellation in *Plasmodium*.

(d) Name the dwarf tapeworm. Describe the life cycle in brief.

(e) Write short notes on any **two**:

(i) Root-knot nematodes

(ii) Hood mockingbird

(iii) Periodicity of microfilaria

(iv) Haemozoin granules.

1+4

$2\frac{1}{2}+2\frac{1}{2}$

—X—



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2024



ZOOADSE06T-ZOOLOGY (DSE3/4)

Time Allotted: 2 Hours

Full Marks: 40

*The figures in the margin indicate full marks.
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1. Answer any **eight** questions from the following: 2×8 = 16
- (a) Name the National Park in West Bengal where red panda is found. In which National Park of West Bengal is one horned rhino found?
- (b) Give the scientific names of one endangered and one vulnerable mammals from India as per IUCN.
- (c) What are the objectives of IUCN?
- (d) How does wildlife tourism benefit conservation?
- (e) Mention two salient features of Wildlife Protection Act, 1972.
- (f) Mention any two challenges in managing tiger reserves in India.
- (g) What is Red Data Book?
- (h) State the ecological importance of mangrove forests.
- (i) What is National Park and how is it different from Wildlife Sanctuary?
- (j) Define keystone species. Give examples.
- (k) Mention two applications of GIS.
- (l) How can we prevent forest fires?
2. Answer any **three** questions from the following: 3×3 = 9
- (a) Discuss three major causes of wildlife depletion in India and suggest possible solutions. 2+1
- (b) What are the disadvantages of eco-tourism in forested areas? Name a biosphere reserve in West Bengal.
- (c) Describe the major forest types of India with the faunal diversity of the forest types.
- (d) Discuss the role of community reserves in the conservation of wildlife with examples from India.
- (e) Enumerate the role of Zoological gardens in ex-situ conservation of wildlife.



3. Answer any **three** questions from the following:

- (a) Discuss the causes and consequences of human-elephant conflicts in West Bengal. Suggest comprehensive strategies to mitigate these conflicts. 4+1
- (b) Explain the role of remote sensing and GIS in forest cover estimation. What is geostationary orbit? 4+1
- (c) Enumerate the role of CITES in conservation of wildlife globally. 2+2+1
- (d) Differentiate between nodes and corridors. State the importance of wildlife corridors. Indicate an elephant corridor in West Bengal. 2+2+1
- (e) What is Man and Biosphere Programme? What are the significances of a Biosphere Reserve? Give examples of Biosphere Reserves outside West Bengal. 2+2+1



WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2023



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) Make distinction between ingression and involution.
 - (b) Write the differences between totipotent and pluripotent stem cell.
 - (c) Name two placental hormones and their functions.
 - (d) Define telolecithal and centrolecithal egg with examples.
 - (e) What is sperm lysin? What is its function?
 - (f) What is vitelline envelope? State its function.
 - (g) What is Amniocentesis?
 - (h) What is ovarian hyperstimulation syndrome?
 - (i) What is secondary organiser? Give an example.
 - (j) What is Nieuwkoop centre?
 - (k) State the function of yolk sac.
 - (l) What do you understand by teratogenesis? Give an example.

2. Answer any **three** questions from the following: 3×3 = 9
 - (a) State the advantages and disadvantages of IVF procedure in humans. 3
 - (b) Draw a labelled diagram of the ultrastructure of mammalian sperm. 1+2
 - (c) What do you understand by slow block to polyspermy during fertilization? 3
 - (d) State the functions of placenta. 3
 - (e) Write the names and functions of extraembryonic membranes in chick. 3

3. Answer any **three** questions from the following: 5×3 = 15
 - (a) "The development of eye in chick is a case of successive induction" — Explain briefly. 5
 - (b) Define regeneration. Describe the four major ways of regeneration. 1+4
 - (c) What are the different cleavage patterns on the basis of yolk present in the egg? Define Balfour's law of cleavage. 3+2
 - (d) State the significant differences observed during the formation of gastrula in frog and chick. 5
 - (e) Describe the role of primary organiser in the light of Spemann-Mangold experiment. 5

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2023

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
- Differentiate between genetic drift and natural selection.
 - Define species.
 - What is gene flow?
 - What is transitional fossil?
 - Who were Denisovans?
 - What is RNA world?
 - Give an example of a living fossil.
 - Name any two proponents of the Modern Synthesis.
 - What is the neutral theory of molecular evolution?
 - What is adaptive radiation?
 - Differentiate between gene frequency and genotype frequency.
 - What is peripatric speciation?
 - What is Muller's ratchet?
2. Answer any **three** questions from the following: 3×3 = 9
- In which age did the genus Homo first appear? What is "out of Africa" hypothesis? 1+2
 - Write a short note on the dating of fossils.
 - Comment on the origin of photosynthesis.
 - How does directional selection work? Explain in your own words.
 - What is the significance of genetic drift in a small population?
 - Mention the periods during which the following events occurred:
 - Trilobites were dominant;
 - Fishes were dominant,
 - Diversification of mammals occurred.



3. Answer any *three* questions from the following:

(a) What are the factors that disrupt H-W equilibrium?

If in a population, 80% individuals can taste a certain chemical and the rest can and the ability to taste is due to the dominant allele A, then what is the frequency of homozygous 'non-taster' (aa) in the population?

(b) Write short notes on sympatric and allopatric speciation.

(c) Write short notes on:

$2\frac{1}{2} + 2\frac{1}{2}$

(i) Molecular clock

(ii) Natural selection

(d) Draw and describe Urey and Miller's experiment. Comment on the conclusions drawn from it.

3+2

(e) Compare the significant evolutionary features of two extinct hominids.

(f) Compare the basic features of Darwinism with Lamarckism.

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2023

ZOADSE05T-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
- What is parasitoid? Cite example.
 - Differentiate mechanical and biological vector.
 - What is *Cysticercus cellulosae*?
 - What is mealy pork?
 - Who serve as the definitive and intermediate hosts of *Leishmania donovani*?
 - Write two medical importance of *Pediculus humanus*.
 - How does zoonosis differ from anthroponosis?
 - How can you define a definitive host and an intermediate host?
 - Name the smallest nematode infecting human. Write down the name of its intermediate host.
 - What is transovarial transmission?
 - What is ookinete?
 - What is Schuffner's dots and Maurer's dots?
2. Answer any **three** questions from the following: 3×3 = 9
- Write down the pathogenicity caused by *Giardia intestinalis*. How it can be prevented? 2+1
 - Distinguish between ticks and mites. 3
 - What is hypnozoite? What is BT malaria and MT malaria? 1+1+1
 - Draw and describe the morphological forms of a blood parasitic protozoa. 3
 - Briefly describe the structure of gravid proglottid of *Taenia solium* with a simple diagram. 2+1



3. Answer any **three** questions from the following:

- (a) Write a note on mosquitoes as vectors of human pathogen.
- (b) What is periodicity? Briefly describe the microfilarial periodicity of *Wuchereria bancrofti*.
- (c) Write notes on any **two**:
- (i) Cookiecutter shark
 - (ii) Hood Mockingbird
 - (iii) Vampire bat.
- (d) Write a note on types of myiasis in brief.
- (e) Write down the scientific name of rat flea and state the disease potential of the parasite. How can it be prevented?

$2\frac{1}{2} + 2\frac{1}{2}$

5

1+3+1

—x—



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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2023



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) State two reasons why wildlife should be conserved. ✓
 - (b) What do you mean by Protected Area?
 - (c) Define Umbrella species. Give example.
 - (d) Mention the scientific names of State Animal and State Bird of West Bengal. ✓
 - (e) State the basic differences between seed bank and germplasm bank.
 - (f) Where would you find Tropical Evergreen Forest and Thorn forest in India? ✓
 - (g) Mention two disadvantages of eco-tourism. ✓
 - (h) Name two elephant reserves of West Bengal. ✓
 - (i) What are vermins as per WPA, 1972? ✓
 - (j) Write the full forms of IUCN and CITES. ✓
 - (k) Which is the natural habitat of Asiatic lion in India? Which North Eastern State of India has a floating National Park? ✓
 - (l) Name two wilderness areas in India where Lion-tailed macaque and Black buck are found.
2. Answer any **three** questions from the following: 3×3 = 9
- (a) What is a Biosphere Reserve? Write a note on the structure of a Biosphere Reserve. 1+2
 - (b) Define critically endangered, endangered and vulnerable species as per IUCN and give Indian example of each category. 3
 - (c) What is meant by wildlife corridor? Enumerate the role of wildlife corridor in conservation. 1+2
 - (d) Discuss the preventive measures of forest fire. 3
 - (e) State the application of Remote Sensing in forest cover estimation. 3



3. Answer any **three** questions from the following:

- (a) Classify the major forest types of West Bengal. Discuss the importance of Sundarbans in biodiversity conservation. 3+2
- (b) State the possible reasons of forest fire. How does it rejuvenate an ecosystem? 5
- (c) Discuss the reasons for rise in man-tiger conflict in India. Suggest some measures to mitigate the problem. 5
- (d) Differentiate between National Parks and Wildlife Sanctuaries with examples from West Bengal.
- (e) Mention the different methods used to estimate population density of wild flora and fauna.

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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:

- (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?
- (e) Briefly describe (with suitable diagram) the process of primitive streak formation in chick.

2+3

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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 premating isolating mechanisms. 5



- (c) Describe disrupting, stabilizing and directional selection with examples.
- (d) Write a short note on adaptive radiation with suitable example. Give examples of adaptive convergence each from placental and marsupial mammal groups.
- (e) What advantages did Bipedalism offered to early hominids? Comment on the theory of use and disuse.
- (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?

3+2

1+4

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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:

- (a) Write about pre-stocking management adopted in composite fish culture. 2+3
- (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

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ZOOADSE05T-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) 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 mealy pork?
 - (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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ZOOADSE06T-ZOOLOGY (DSE3/4)

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



1+2+2

2+3

3. Answer any *three* questions from the following:

- (a) Enumerate the role of NTCA to conserve tigers in India. How is Buxa rejuvenated as a tiger habitat?
- (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.
- (c) What is geostationary satellite? Discuss, how forest cover changes may be monitored by Remote Sensing and GIS.
- (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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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2021

ZOOACOR13T-ZOOLOGY (CC13)

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
- What are totipotent cells? Give an example.
 - What is spermiogenesis?
 - What is the primary organizer? State its role in development.
 - What is fertilization cone?
 - Draw a neat diagram of the Fate map of chick blastoderm.
 - What is discoblastula?
 - State the location and function of vitelline envelope.
 - What is capacitation?
 - Define area pellucida and area opaca.
 - In which type of egg the yolk is concentrated in the vegetal pole? Which type of egg is present in human? 1+1
 - What are the functions of Leydig cells?
 - Define Amniocentesis.
2. Answer any **three** questions from the following: 3×3 = 9
- Briefly explain spermiogenesis. What is the function of Sertoli cell? 2+1
 - Classify eggs on the basis of distribution and amount of yolk. 3
 - What is Fate map? Discuss about one technique used for fate mapping. 1+2
 - Briefly describe any three morphogenetic movements during gastrulation. 1+1+1
 - State the risks involved in In vitro fertilization (IVF). 3
 - Write a note on Spemann's organizer. 3



3. Answer any *three* questions from the following:

- (a) Explain the steps of development of lens in vertebrate with diagram.
- (b) Classify teratogens based on their different types. Write an example of a most common notorious teratogenic agent. What are the malformations caused due to the effect of teratogenic agent on embryonic development?
- (c) What is the mechanism of 'fast block' to polyspermy? 5
- (d) Describe the role of yolk in determining the pattern of cleavage. 5
- (e) Classify placenta in mammals according to distribution of villi and intimacy between foetal and maternal tissue with example and diagram. 5
- (f) Give an account of the growth phase of oogenesis. 5

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2021

ZOOACOR14T-ZOOLOGY (CC14)

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.
All symbols are of usual significance.*

1. Answer any **eight** questions from the following: 2×8 = 16
- What do you mean by RNA world hypothesis?
 - What is hot dilute soup?
 - What are the factors that disrupt H-W equilibrium?
 - What is Darwinian fitness?
 - What is blending hypothesis of inheritance?
 - Name the various periods of Palaeozoic era.
 - What is 'founder effect'?
 - What are the effects of a genetic drift?
 - What is radioactive clock method?
 - In which periods birds and amphibians originated?
 - State two post mating isolating mechanism.
 - What is gene pool?
 - What is stabilizing selection?
 - Who are Cro-magnons?
2. Answer any **three** questions from the following: 3×3 = 9
- How can you determine the age of fossils by radioactive carbon method? What are the drawbacks of this method?
 - Distinguish between man and ape.
 - Define Darwinian fitness and selection coefficient.
 - What is genetic drift? What are the consequences of genetic drift?
 - What is the basic principle of a molecular clock?
 - Write a short note on the types of fossils.



3. Answer any *three* questions from the following:

- (a) Define biological species. Discuss the drawbacks of biological species concept. 3+2
- (b) Describe the processes of allopatric and sympatric speciation with examples. What is cline? 5
- (c) Name the divisions of the coenozoic era. What is the importance of this era? $2\frac{1}{2} + 2\frac{1}{2}$
- (d) How does a vertebrate globin gene prove evolution? $2\frac{1}{2} + 2\frac{1}{2}$
- (e) Describe disrupting and directional selection with examples.
- (f) Write short notes on founder effect and population bottleneck with examples.

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2021

ZOOADSE04T-ZOOLOGY (DSE3/4)

FISH AND FISHERY

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: 2×8 = 16
- (a) What is Pen culture?
 - (b) What do you mean by “drag net” and “bag net”?
 - (c) What is EEZ?
 - (d) Name two synthetic hormones used in induced breeding of carp.
 - (e) State the causative agent and symptoms of abdominal dropsy.
 - (f) What is red gland? State its function.
 - (g) What do you mean by “column feeder” and “bottom feeder” fish?
 - (h) What is gill raker? Write its function.
 - (i) What do you mean by “estuary”? Give scientific name of one ichthyofauna of estuary of West Bengal.
 - (j) Define polyculture. Write the proper ratio of Indian major carps in polyculture.
 - (k) “Western coast of India has higher fish production.” – Why?
 - (l) State the basic difference between intrinsic and extrinsic bioluminescence in fish.
 - (m) Write the name and use of any two fishing craft.
 - (n) What do you mean by ovoviviparity in shark?
2. Answer any **three** questions: 3×3 = 9
- (a) What is Cage culture? Write its merits and demerits. 3
 - (b) What do you mean by transgenic fish? Write the importance of transgenic fishes. 1+2
 - (c) Briefly state about physoclistous and physostomous swim bladder. 1 $\frac{1}{2}$ + 1 $\frac{1}{2}$
 - (d) Classify fish depending on feeding habit and give example of each. 3
 - (e) Write in brief about Eco-hatchery along with its merits and demerits. 3



3. Answer any *three* questions:

- (a) Briefly state the structure of septal gill and explain how it works during respiration. 1+2+2
- (b) Define induced breeding. Explain the process of hormone extract preparation during this technique. What is the dose and injection technique follows here? 3+2
- (c) Explain the causes of depletion of fishery resources. State the basic importance of remote sensing in fishery. 5
- (d) Explain in brief how remote sensing and GIS can be applied in fisheries? 5
- (e) Discuss about bioluminescence in fishes.

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WEST BENGAL STATE UNIVERSITY

B.Sc. Honours 6th Semester Examination, 2021

ZOOADSE05T-ZOOLOGY (DSE3/4)

Time Allotted: 2 Hours

Full Marks: 40

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All symbols are of usual significance.*

1. Answer any **eight** questions from the following: 2×8 = 16
 - (a) What is signet ring?
 - (b) What is 'hypnozoite'?
 - (c) Write two differences between soft ticks and hard ticks.
 - (d) What are the recommended drugs for *Schistosomiasis*?
 - (e) What is *cysticercus cellulosae*?
 - (f) What are the differences between biological and chemical vectors?
 - (g) Define parasitoid. Give an example.
 - (h) Define zoonosis.
 - (i) Name two families which are responsible for myiasis.
 - (j) Name the causative agent and vector of Kala-azar.
 - (k) What is febrile paroxysm?
 - (l) How Meloidogyne damages a plant?
 - (m) What is 'gynaecophoric canal'?
 - (n) What is 'Loeffler's syndrome'?
 - (o) Define 'ookinete'.

2. Answer any **three** questions from the following: 3×3 = 9
 - (a) Write the pathogenicity caused by *Entamoeba histolytica*. 3
 - (b) Describe briefly about the structure of rostrum of *Taenia*. What is gravid proglottids? 2+1
 - (c) What are the differences between male and female *Ascaris*? 3
 - (d) Write a short note on 'microfilarial periodicity'. 3
 - (e) Why mosquitoes are considered as vectors to spread pathogens. 3

3. Answer any **three** questions from the following: 5×3 = 15
 - (a) Describe the human cycle of *Plasmodium vivax* with suitable diagram. 3+2
 - (b) What is the pathogenicity and prophylaxis of *Taenia solium*. 3+2
 - (c) Write about the life cycle and pathogenicity of *Giardia intestinalis*. 3+2
 - (d) Describe the life cycle of body louse and how it acts as an agent to spread diseases. 3+2
 - (e) What is 'LD body'? Discuss the role of Sand fly as host and vector of Visceral Leishmaniasis. Name a drug used to treat the disease. 1+3+1

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WEST BENGAL STATE UNIVERSITY
B.Sc. Honours 6th Semester Examination, 2021

ZOOADSE06T-ZOOLOGY (DSE3/4)

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.
All symbols are of usual significance.*

1. Answer any **eight** questions from the following: 2×8 = 16
- (a) What is meant by core and buffer area in a wildlife sanctuary?
 - (b) What do you mean by prey base study for tiger?
 - (c) Name one Ramsar site and a biosphere reserve from West Bengal.
 - (d) What do you mean by a geostationary satellite?
 - (e) What are trap cropping and buffer cropping? Give examples.
 - (f) Give the full forms of CITES and IUCN.
 - (g) Where do you find dry deciduous and mixed moist deciduous forests in West Bengal?
 - (h) State the status and distribution of Bengal Florican.
 - (i) Differentiate between nodes and corridors. Indicate an elephant corridor in the northern West Bengal.
 - (j) Mention two *in situ* conservation strategies for the one-horned Rhinoceros.
 - (k) What do you mean by community reserve? Give example.
 - (l) Give the scientific names of one critical and one vulnerable mammals from India.
2. Answer any **three** questions from the following: 3×3 = 9
- (a) Where do you find alluvial grasslands in West Bengal. Mention the importance of grassland ecosystem. 1+2
 - (b) What are sentinel species? Why are they important? 1+2
 - (c) Comment on the application of satellite imaging in vegetation mapping. 3
 - (d) Enumerate the roles of zoo gardens as an *ex situ* measure of wildlife conservation. 3
 - (e) Write a note on the structure of a biosphere reserve. 3



3. Answer any *three* questions from the following:
- (a) Describe the various reasons for depletion of wildlife resource in India.
 - (b) Define human-animal conflict. State the reasons for increasing conflict between human and elephant in West Bengal. Suggest some measures to mitigate such problem.
 - (c) Distinguish between wildlife sanctuary and national park. Name the biosphere reserves of India with their respective locations. 2+3
 - (d) Discuss about the salient features, merits and demerits of WPA, 1972. 3+1+1
 - (e) Add a note on joint forest management (JFM). 5

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