

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2020

(CCSS)

M.Sc. Applied Zoology

ZOO 2C 10—ANIMAL PHYSIOLOGY AND ENDOCRINOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write essays on any *two* of the following :

- 1 Enumerate the physiology of muscle contraction.
- 2 Explain the mechanisms of transmission of nerve impulse.
- 3 Elaborate on the regulation of respiration.
- 4 Write an account on various aspects of sports physiology.

(2 × 15 = 30 marks)

II. Write short essays on any *three* of the following :

- 5 Describe the regulation of hormone secretion.
- 6 Write on mechanoreceptors.
- 7 Explain the chemical and neurohormonal regulation of cardiac amplitude and frequency.
- 8 Write on various nutritional disorders.
- 9 Write on neurotransmitters.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following :

- 10 Principle of similarity.
- 11 Constipation.
- 12 Atherosclerosis.
- 13 Artificial kidney.
- 14 Cochlea.
- 15 Amoeboid movement.
- 16 Hormone therapy.
- 17 Hirsutism.

(5 × 4 = 20 marks)

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M.Sc. Applied Zoology

ZOO 2C 09—BIOTECHNOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write essays on any *two* of the following. Each question carries 15 marks :

- 1 Explain the techniques used in gene therapy.
- 2 Write on methods and applications in whole genome sequencing.
- 3 Write issues on patenting organisms. Add note on global level initiatives on organisms patenting.
- 4 Write an account on Bioinformatics and its application in phylogeny and taxonomy.

(2 × 15 = 30 marks)

II. Write short essays on any *three* of the following. The question carries 10 marks :

- 5 Distinguish different blotting techniques.
- 6 Genetic manipulation and antibody engineering.
- 7 Explain different safety standards applied in DNA research.
- 8 Write on various genomic libraries in genomic research.
- 9 Real time PCR and application.
- 10 Gene knockouts and application.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following. Each question carries 4 marks :

- 11 Human gene therapy and ethic issues.
- 12 DNAi and viruses.

- 13 Monoclonal antibodies and infectious diseases.
- 14 Primary Data Bases.
- 15 IPR.
- 16 SNP analysis.
- 17 Biosafety and recombinant DNA.
- 18 Cloning vectors.

(5 × 4 = 20 marks)

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SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2020

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M.Sc. Applied Zoology

ZOO 2C 08—MOLECULAR BIOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write essays on any *two* of the following :

- 1 Write an account of protein synthesis.
- 2 Write on the mechanisms of transcription and post synthetic modification.
- 3 Explain the reassociation kinetics of eukaryotic DNA. Write notes on genomic complexity.
- 4 Explain models of DNA replication.

(2 × 15 = 30 marks)

II. Write short essays on any *three* of the following :

- 5 Write on restriction enzymes in bacteria.
- 6 Explain alternative pathways in eukaryotic gene expression.
- 7 Explain DNA repair in eukaryotes.
- 8 Write an essay on the mechanisms of gene expression in phages.
- 9 Write an essay on interrupted genes.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following :

- 10 Metastasis.
- 11 Selfish DNA.
- 12 miRNA.
- 13 Telomeres.
- 14 Wobble hypothesis.
- 15 Antisense RNA.
- 16 Promotor.
- 17 Oncogenes.

(5 × 4 = 20 marks)

SECOND SEMESTER P.G. DEGREE EXAMINATION, APRIL 2020

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M.Sc. Applied Zoology

ZOO 2C 07—CYTOGENETICS AND EVOLUTION

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A (Cytogenetics)I. Write an essay on any *one* of the following :

- 1 Elaborate on transposable elements with reference to their classification, examples and functions.
- 2 Explain the methods of physical and transcript gene mapping.

(1 × 15 = 15 marks)

II. Write short essays on any *two* of the following :

- 3 Elaborate on different mutant types.
- 4 Explain various aspects of linkage and crossing over.
- 5 Write a concise account on signaling through cell surface receptors.
- 6 Explain cellular communication with reference to extracellular matrix.

(2 × 10 = 20 marks)

III. Write short notes on any *five* of the following :

- 7 Selecting.
- 8 Cell signaling by nitric oxide.
- 9 Caspases.
- 10 Cytoplasmic inheritance.
- 11 Phenocopy.
- 12 LOD score.
- 13 NHEJ pathway.
- 14 P elements.

(5 × 3 = 15 marks)

Turn over

Part B (Evolution)

IV. Write an essay on any *one* of the following :

- 15 "Population genetics was a vital ingredient in the emergence of the modern evolutionary synthesis." Substantiate.
- 16 Explain various kinds of molecular phylogenies.

(1 × 15 = 15 marks)

V. Write short notes on any *five* of the following :

- 17 Evolutionary significance of junk DNA.
- 18 Neanderthals.
- 19 Coenozoic era.
- 20 UPGA Method.
- 21 RNA world hypothesis.
- 22 Parapatric speciation.
- 23 Colonial theory.

(5 × 3 = 15 marks)

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Applied Zoology

ZOO 2C 10—ANIMAL PHYSIOLOGY AND ENDOCRINOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write essays on any *two* of the following :

- 1 Elaborate on the mechanisms of transmission of nerve impulse.
- 2 Write an account on mechanoreceptors.
- 3 Explain the mechanism of tubular reabsorption and secretion.
- 4 Write a concise account on the various aspects of sports physiology.

(2 × 15 = 30 marks)

II. Write short essays on any *three* of the following :

- 5 Explain the role of hormones in reproduction.
- 6 Describe the energetics of muscle contraction.
- 7 Write on various kidney disorders.
- 8 Enumerate the adaptations to special dietary patterns.
- 9 Write on neural and chemical regulation of respiration.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following :

- 10 Scaling of locomotion.
- 11 Ulcer.
- 12 Placental circulation.
- 13 Nephritic syndrome.
- 14 Sensory coding.
- 15 Environmental physiology.
- 16 Hormones in developmental process.
- 17 PCOS.

(5 × 4 = 20 marks)

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Applied Zoology

ZOO 2C 09—BIOTECHNOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write essays on any *two* of the following :

- 1 Write an essay on different types of cloning vectors.
- 2 Write an account on molecular probes. Add notes on their applications.
- 3 Explain PCR techniques.
- 4 Enumerate genome sequencing techniques.

(2 × 15 = 30 marks)

II. Write short essays on any *three* of the following :

- 5 Write on monoclonal antibodies and their applications.
- 6 Explain transgenic animals and gene knockout.
- 7 Write on IPR and plant genetic resources.
- 8 Explain concepts of biosafety and issues.
- 9 Elaborate on gene therapy and its uses.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following :

- 10 RNAi.
- 11 CLUSTAL W.
- 12 SNP analysis.
- 13 BAC Library.
- 14 Restriction endonucleases.
- 15 Southern blotting.
- 16 Sequence analyses.
- 17 Genetic counseling.

(5 × 4 = 20 marks)

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Applied Zoology

ZOO 2C 08—MOLECULAR BIOLOGY

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

I. Write essays on any *two* of the following. Each question carries 15 marks :

- 1 Write an account on different models of DNA replication.
- 2 Write on restriction enzymes and their applications.
- 3 Explain the mechanisms of gene expression in eukaryotes.
- 4 Write an essay on types of DNA in eukaryotic genome. Write a note on reassociation kinetics.

(2 × 15 = 30 marks)

II. Write short essays on any *three* of the following. Each question carries 10 marks :

- 5 Write on types of DNA repair mechanism in prokaryotes.
- 6 Describe salient features of genetic code.
- 7 Explain post translational modification of proteins.
- 8 Write an account on the role of genes in cancer.
- 9 Write on human genome sequencing.

(3 × 10 = 30 marks)

III. Write short notes on any *five* of the following. Each question carries 4 marks :

- 10 RFLP and its importance.
- 11 Frame shift mutation.
- 12 Translation inhibitors.

- 13 siRNA in gene expression.
- 14 Catabolite repression.
- 15 Histone acetylation and deacetylation.
- 16 Replicons.
- 17 Gene therapy and cancer.

(5 × 4 = 20 marks)

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Applied Zoology

ZOO 2C 07—CYTOGENETICS AND EVOLUTION

(2019 Admissions)

Time : Three Hours

Maximum : 80 Marks

Part A (Cytogenetics)I. Write an essay on any *one* of the following :

- 1 Elaborate on the concept and mechanisms of cell signaling.
- 2 Explain the techniques of gene mapping with molecular markers.

(1 × 15 = 15 marks)

II. Write short essays on any *two* of the following :

- 3 Write a concise account on chromosomal aberrations and their genetic implications.
- 4 Enumerate the extensions of Mendelian principles.
- 5 Elucidate the methods of interaction of cells with other cells.
- 6 Explain the mechanism of cell death.

(2 × 10 = 20 marks)

III. Write short notes on any *five* of the following :

- 7 Regulation of neurotransmission.
- 8 Therapeutic intervention of apoptosis.
- 9 Cis-trans test.
- 10 Holandric traits.
- 11 FISH.
- 12 Site-specific recombination.
- 13 Insertional mutagenesis.
- 14 Yeast Ty elements.

(5 × 3 = 15 marks)

Turn over

Part B (Evolution)

IV. Write an essay on any *one* of the following :

- 15 Elaborate on isolating patterns and mechanisms.
- 16 Explain the molecular tools in phylogeny.

(1 × 15 = 15 marks)

V. Write short notes on any *five* of the following :

- 17 Recombinational speciation.
- 18 Meiotic drive.
- 19 Neo-Darwinism.
- 20 Parsimony based method in phylogeny.
- 21 Australopithecines.
- 22 Proterozoic era.
- 23 Planula theory.

(5 × 3 = 15 marks)