2017

(6th Semester)

ZOOLOGY

Paper : ZL–IX

(Molecular Biology and Genetics)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

1. Describe in detail the structure of tRNA with a neat labeled diagram. 7

Or

Write short notes on the following : 3½+3½=7

(a) Heterochromatin

(b) Lampbrush chromosome

2. Describe the mechanism of DNA replication in prokaryotic cell. 7

Or

Discuss the different types and causes of DNA damage, and add a note on the repair of single-stranded damage of DNA. 7

3. What do you understand by genetic code? Give a detailed account of genetic code. 7

Or

What is an operon? Give an illustrated account of *lac* operon. 7

4. Write short notes on the following : 3½+3½=7

(a) Chromosome theory of inheritance

(b) Pleiotropism

Or

What are multiple alleles? Explain the inheritance of multiple alleles with two examples. 7

5. What is sex-linked inheritance? Explain this phenomenon with reference to man and *Drosophila* giving suitable examples. 7

Or

Write short notes on the following : 3½+3½=7

(a) Chromosomal sex determination

(b) Complete linkage

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Subject Code : ZOO/VI/09

Booklet No. A

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(6th Semester)

ZOOLOGY

Paper : ZL–IX

(Molecular Biology and Genetics)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

1. The distance between two nucleotides in a double-helix DNA is

(a) 34 Å ( )

(b) 3·4 Å ( )

(c) 20 Å ( )

(d) 10 Å ( )

2. Semi-conservative method of DNA replication was proved by

(a) Watson and Crick ( )

(b) Meselson and Stahl ( )

(c) Jacob and Monod ( )

(d) Sutton and Boveri ( )

3. The 3 -OH of one nucleotide is linked to 5 phosphate of the next nucleotide by

(a) phosphodiester bond ( )

(b) hydrogen bond ( )

(c) peptide bond ( )

(d) disulphide bond ( )

4. Which one of the following is an example of codominance?

(a) ABO blood group in man ( )

(b) Eye colour in *Drosophila* ( )

(c) Kernel colour in wheat ( )

(d) Coat colour of Shorthorn breed of cattle ( )

5. When an abnormal egg with XX chromosome is fused with normal sperm carrying Y chromosome, it results in

(a) Turner's syndrome ( )

(b) Down's syndrome ( )

(c) Patau's syndrome ( )

(d) Klinefelter's syndrome ( )

SECTION—B

(*Marks* : 15)

Write short notes on the following in not more than *5* to *8* sentences each :

3×5=15

1. Nucleosome

2. Semi-discontinuous replication

3. Initiation complex of protein synthesis

4. Epistasis

5. Crossing-over

★★★

2017

(6th Semester)

ZOOLOGY

Paper : ZL–X

(Developmental Biology)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

1. What do you mean by parthenogenesis? Describe the different processes of parthenogenesis giving suitable examples. 1+6

Or

Mention the different types of egg with labelled diagrams. 7

2. Write down the gastrulation process in Amphioxus. 7

Or

What are the functions of placenta? Describe the classifications of mammalian placenta. 3+4

3. Explain the gradient theory with experimental evidences. 7

Or

Discuss the concept of embryonic induction giving examples. 7

4. Write about the metamorphosis of insect and its hormonal regulation. 7

Or

Describe the process of regeneration in invertebrates. 7

5. Explain the developmental defects. 7

Or

Write an account on IVF. 7

★★★

Subject Code : ZOO/VI/10

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(6th Semester)

ZOOLOGY

Paper : ZL–X

(Developmental Biology)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

Put a Tick (✓) mark against the correct answer in the brackets provided : 1×5=5

1. Thelytoky refers to

(a) complete parthenogenesis ( )

(b) incomplete parthenogenesis ( )

(c) haploid parthenogenesis ( )

(d) diploid parthenogenesis ( )

2. The developed chick embryo which has an F-shaped is

(a) 24 hours ( )

(b) 33 hours ( )

(c) 48 hours ( )

(d) 72 hours ( )

3. On reaching the blastopore lips, the cells migrate inwards by rolling over the lateral and ventral lips of blastopore in the process of

(a) invagination ( )

(b) involution ( )

(c) ingression ( )

(d) None of the above ( )

4. Among vertebrates, the regeneration process is most astonishing in

(a) amphibian ( )

(b) reptilian ( )

(c) avian ( )

(d) mammalian ( )

5. The hormone which helps in maintenance of pregnancy and prevents premature parturition is

(a) oestrogen ( )

(b) progesterone ( )

(c) relaxin ( )

(d) None of the above ( )

SECTION—B

(*Marks* : 15)

Write short notes on the following in not more than *5* to *8* sentences each : 3×5=15

1. Cleavage

2. Invagination

3. Morphogenetic fields

4. Thyroxine

5. Pluripotent stem cell

★★★

2017

(6th Semester)

ZOOLOGY

Paper : ZL–XI

(Parasitology and Immunology)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The questions are of equal value

1. Describe the life cycle of *Leishmania donovani*.

Or

Illustrate the life cycle of *Plasmodium falciparum*.

2. Discuss the life cycle of *Taenia solium*.

Or

Explain the important parasitic adaptations in cestodes.

3. Give an account on parasitic adaptations in nematodes.

Or

Describe the life cycle of *Ascaris lumbricoides*.

4. Give brief description of acquired immunity.

Or

Describe components of innate immunity.

5. Describe different types of immunoglobulin.

Or

Describe the structure and function of major histocompatibility complex.

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Subject Code : ZOO/VI/11

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(6th Semester)

ZOOLOGY

Paper : ZL–XI

(Parasitology and Immunology)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

1. Put a Tick (✓) mark against the correct answer in the corresponding brackets : 1×5=5

(a) Epimastigote is found in

(i) Sand fly ( )

(ii) *Anopheles* mosquito ( )

(iii) Tsetse fly ( )

(iv) *Culex* mosquito ( )

(b) Neurocysticercosis is caused by

(i) *Taenia saginata* ( )

(ii) *Taenia solium* ( )

(iii) *Echinococcus granulosus* ( )

(iv) *Leishmania donovani* ( )

(c) Symptoms of schistosoma infections are produced by its

(i) sporocysts ( )

(ii) cercariae ( )

(iii) miradidia ( )

(iv) eggs ( )

(d) The antigen-binding site of an antibody is called

(i) paratope ( )

(ii) epitope ( )

(iii) hapten ( )

(iv) immunogen ( )

(e) The multiple sclerosis is

(i) type-I hypersensitivity ( )

(ii) type-II hypersensitivity ( )

(iii) type-III hypersensitivity ( )

(iv) type-IV hypersensitivity ( )

SECTION—B

(*Marks* : 15)

2. Write short notes on the following in *5* to *8* sentences each : 3×5=15

(a) African sleeping sickness

(b) Hydatid disease

(c) Cercaria of *Schistosoma mansoni*

(d) Interferon

(e) Heavy chains of an immunoglobulin

★★★

2017

(6th Semester)

ZOOLOGY

Paper : ZL–XII (A)

(Biotechnology and Bioinformatics)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

1. What is DNA fingerprinting? Describe the process and applications of DNA finger-printing. 1+(3+3)=7

Or

Write short notes on the following : 3½+3½=7

(a) Southern blotting

(b) Applications of PCR

2. Elucidate, with appropriate diagrams, the basic steps involved in gene cloning. 7

Or

Write short notes on the following : 3½+3½=7

(a) Taq polymerase

(b) Vectors in genetic engineering

3. Write a note on the important applications of genetic engineering in medicine. 7

Or

Write short notes on the following : 3½+3½=7

(a) cDNA library

(b) Somatic gene therapy

4. Define 'bioinformatics'. What are the applications of bioinformatics? 2+5=7

Or

Write short notes on the following : 3½+3½=7

(a) Importance of Internet for biologists

(b) Steps in information retrieval

5. Define 'database'. Explain different types of database in bioinformatics. 2+5=7

Or

Write short notes on the following : 3½+3½=7

(a) BLAST

(b) EMBL

★★★

Subject Code : ZOO/VI/12 (a)

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(6th Semester)

ZOOLOGY

Paper : ZL–XII (A)

(Biotechnology and Bioinformatics)

(PART : A—OBJECTIVE)

(*Marks* : 20)

The figures in the margin indicate full marks for the questions

SECTION—A

(*Marks* : 5)

1. Put a Tick (✓) mark against the correct answer in the corresponding brackets : 1×5=5

(a) Western blotting is the detection and isolation of

(i) DNA ( )

(ii) protein ( )

(iii) RNA ( )

(iv) cells ( )

(b) Enzymes used for joining of DNA fragments are called

(i) helicase ( )

(ii) ligase ( )

(iii) polymerase ( )

(iv) Klenow fragment ( )

(c) Gene library is defined as

(i) collection of genomic DNA from different species ( )

(ii) collection of total DNA of the whole organism ( )

(iii) collection of reverse transcribed DNA ( )

(iv) collection of all nucleic acids ( )

(d) The main purpose of operating system is

(i) to provide an environment for development and execution of programs ( )

(ii) to manage computational activities of a computer system ( )

(iii) Both *(i)* and *(ii)* ( )

(iv) None of the above ( )

(e) NCBI is an Internet database of

(i) proteins ( )

(ii) DNA ( )

(iii) RNA ( )

(iv) enzymes ( )

SECTION—B

(*Marks* : 15)

2. Write short notes on the following in *5* to *8* sentences each : 3×5=15

(a) Northern blotting

(b) Restriction enzymes

(c) Basic operating systems

(d) Gene library

(e) Difference between genome and proteome database

★★★

2017

(6th Semester)

ZOOLOGY

Paper No. : ZL–XII (B)

(Animal Ecology and Wildlife)

Full Marks : 55

Time : 2½ hours

(PART : B—DESCRIPTIVE)

(*Marks* : 35)

The figures in the margin indicate full marks for the questions

1. Explain in brief food chain and food webs. 7

Or

Describe the energy flow in lake ecosystem. 7

2. Describe the different processes involved in phosphorus cycle. 7

Or

Describe the steps involved in sulphur cycle. 7

3. Write short notes on greenhouse effect and law of limiting factors. 3½+3½=7

Or

Explain the general process of ecological successions. 7

4. Write short notes on species richness and species diversity. 3½+3½=7

Or

Explain Sorensen and Shannon-Wiener indices. 7

5. What is the natural resource? Write about conservation of soil. 2+5=7

Or

Explain anthropogenic activity and effects on environment. 7

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Subject Code : ZOO/VI/12 (b)

Booklet No. A

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(6th Semester)

ZOOLOGY

Paper : ZL–XII (B)

(Animal Ecology and Wildlife)

(PART : A—OBJECTIVE)

(*Marks* : 20)

SECTION—A

(*Marks* : 5)

Each question carries 1 mark

Put a Tick (✓) mark against the correct answer in the corresponding brackets :

1. Basically _____ types of food chain are recognized.

(a) 2 ( )

(b) 3 ( )

(c) 4 ( )

(d) 5 ( )

2. Which of the following is denitrifying bacteria?

(a) *Azotobacter* ( )

(b) *Clostridium* ( )

(c) *Pseudomonas* ( )

(d) None of the above ( )

3. Which of the following is the gas mainly responsible for greenhouse effect?

(a) CO ( )

(b) CO_2 ( )

(c) SO_2 ( )

(d) NO_2 ( )

4. In ecology, polyspecific population is known as

(a) density ( )

(b) group ( )

(c) species ( )

(d) community ( )

5. The Wildlife Conservation Act was enacted by the Government of India in

(a) 1980 ( )

(b) 1972 ( )

(c) 1982 ( )

(d) 1970 ( )

SECTION—B

(*Marks* : 15)

Each question carries 3 mark

Write short notes on the following :

1. Ecosystem

2. Nitrogen cycle

3. Global warming

4. Community

5. Wildlife conservation

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