Or

(*i*) Embryonic induction

(*ii*) Physiology of placenta.

4. Discuss the modes of regeneration.

Or

(*i*) Concepts of ageing

(*ii*) Morphological changes during metamorphosis.

5. What is teratogenesis ? Explain effect of teratogenic agents during metamorphosis.

Or

(*i*) Invitro-fertilization.

(*ii*) Stem cell culture.

———————

5th Semester Examination, 2021

Time : 3 hours

Full Marks : 60

Answer any **one** Group as per your Syllabus

Answer from **all** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

GROUP—A

(MODEL SYLLABUS)

(MOLECULAR BIOLOGY)

SECTION—A

1. Answer the following within *one* word or fill in the blanks : 1 × 8

(*a*) Name the bond by which nucleotides join

with one another to form a single strand of nucleic acid.

(*b*) The telomeric sequence of human is _____.

(*c*) _____ enzyme catalyzes the addition of an amino acid residue in order to grow the polypeptide chain.

(*d*) A prokaryotic gene of 600 nucleotide long can form a polypeptide of _____ amino acids.

(*e*) The process of the removal of introns from h_n RNA is called _____.

(*f*) The Goldberg-Hogness box found in the core promoter region of most eukaryotic gene is also known as _____.

(*g*) Where do the transcription regulators bind in prokaryotes during transcription ?

(*h*) In t-RNA processing the terminal UU is replaced by _____.

(*Continued*)

SECTION – B

2. Answer any *eight* of the following within *two* or *three* sentences each : $1\frac{1}{2} \times 8$

(*a*) What did the Meselson-Stahl experiment prove ?

(*b*) How is DNA replication bidirectional and semi-discontinuous ?

(*c*) How can you define code, codon, and anti-codon ?

(*d*) What are inhibitors of protein synthesis ?

(*e*) What is Teminism ?

(*f*) Define aminoacylation with example.

(*g*) What is a potential benefit of exon shuffling ?

(*h*) What does RNA editing do ?

(*Turn Over*)

(*i*) How can you define a negative inducible operon ?

(*j*) What roles do enhancers play in transcription ?

SECTION – C

3. Write short notes on any *eight* of the following within *75* words each : 2×8

(*a*) RNA priming

(*b*) Replication of telomeres

(*c*) Thymine dimerization

(*d*) Degeneracy of genetic code

(*e*) Regulation of transcription

(*f*) Fidelity of protein synthesis

(*g*) Globin m-RNA

(*h*) Alternative splicing

(*i*) Repressible operon

(*j*) Si-RNA.

SECTION – D

Answer the following questions within **500** words each : 6×4

4. Explain the role of the enzymes and proteins involved in DNA replication.

Or

Write notes on :

(*i*) Mismatch repair

(*ii*) Nucleotides.

5. Give an account of the transcription factors.

Or

Prepare a genetic code table specifying amino acids for each codon and explain Wobble hypothesis.

6. Describe the mechanism of splicing.

Or

Discuss the concepts of introns and exons.

7. Discuss transcriptional regulations with reference to lac-operon.

Or

Write notes on :

(*i*) RNA interference

(*ii*) Gene silencing.

GROUP – B

(OLD SYLLABUS)

(DEVELOPMENTAL BIOLOGY)

SECTION – A

1. Answer *all* questions in *four* to *five* sentences each : 2×6

(*a*) What is amphimixis ?

(*b*) What is Meroblastic cleavage ?

(*c*) What is epiboly ?

(*d*) What is primary organizer ?

(*e*) Explain role of thyroxine during Anuran metamorphosis.

(*f*) What are the stem cells ?

SECTION – B

Answer **all** questions : 12×4

2. Explain spermatogenesis.

Or

(*i*) Types of eggs

(*ii*) Embryonic induction

3. Discuss the extra-embryonic membranes in birds.

Or

(*i*) RNA Polymerase

(*ii*) Wobble hypothesis.

4. Discuss the structure of globin m-RNA.

Or

(*i*) Split genes

(*ii*) RNA editing.

5. Discuss the principles of transcriptional regulation in Lac Operon.

Or

(*i*) Ribo-switches

(*ii*) Si-RNA.

SHZOO – 12

5th Semester Examination, 2021

Time : 3 hours

Full Marks : 60

Answer any **one** Group as per your Syllabus

Answer from **all** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

GROUP – A

(MODEL SYLLABUS)

(PRINCIPLES OF GENETICS)

SECTION – A

1. Answer the following in *one* word or fill in the blanks : 1×8

(*a*) How many types of gametes will be formed in F_2 generation by an individual with genotype AaBbCc ?

(*b*) The phenomenon of multiple phenotypic expression of a single gene is called _____ .

(*c*) 5 BU is a structural analogue of _____ ?

(*d*) How many chromosomes would be expected in a trisomic if the diploid number of an organism is 12 ?

(*e*) One of the X-chromosomes is inactivated in a process called _____ to become a Barr body.

(*f*) The transfer of a part of a chromosome or a set of genes to a non-homologous one is called _____.

(*g*) _____ discovered the jumping genes.

(*h*) The process by which the transfer of genetic material from one microorganism to another occurs by a viral agent is called _____ .

SECTION – B

2. Answer any *eight* of the following within *two* or *three* sentences each: $1\frac{1}{2} \times 8$

(*a*) Differentiate between a test cross and a back cross.

(*b*) How can you explain the ratio 1 : 2 : 1 in laws of inheritance ?

(*c*) What does positive interference mean in genetics ?

(*d*) How does UV-A radiation cause mutation in the DNA ?

(*e*) Why are some strains of paramecia are called killer paramecia ?

(*f*) What is mitochondrial mutation in yeast ?

(*g*) Distinguish between two factor and three factor crosses.

(*h*) How do multiple alleles originate ?

(*a*) How many types of gametes will be formed in F_2 generation by an individual with genotype AaBbCc ?

(*b*) The phenomenon of multiple phenotypic expression of a single gene is called _____ .

(*c*) 5 BU is a structural analogue of _____ ?

(*d*) How many chromosomes would be expected in a trisomic if the diploid number of an organism is 12 ?

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(*g*) _____ discovered the jumping genes.

(*h*) The process by which the transfer of genetic material from one microorganism to another occurs by a viral agent is called _____ .

SECTION – B

2. Answer any *eight* of the following within *two* or *three* sentences each: $1\frac{1}{2} \times 8$

(*a*) Differentiate between a test cross and a back cross.

(*b*) How can you explain the ratio 1 : 2 : 1 in laws of inheritance ?

(*c*) What does positive interference mean in genetics ?

(*d*) How does UV-A radiation cause mutation in the DNA ?

(*e*) Why are some strains of paramecia are called killer paramecia ?

(*f*) What is mitochondrial mutation in yeast ?

(*g*) Distinguish between two factor and three factor crosses.

(*h*) How do multiple alleles originate ?

(*i*) Why is bacterial transformation important ?

(*j*) What is the use of complementation test ?

SECTION – C

3. Write short notes on any *eight* of the following within *75* words each : 2×8

(*a*) Polygenic inheritance

(*b*) Lethal alleles

(*c*) Interference and Coincidence

(*d*) Chemical Mutagens

(*e*) Frame shift mutation

(*f*) Complete linkage

(*g*) Y-chromosome of human

(*h*) Extra-nuclear inheritance by mitochondria

(*i*) Antibiotic resistance

(*j*) Transduction

(*k*) P-elements in Drosophila.

(*Continued*)

SECTION – D

Answer the following within **500** words each : 6×4

4. Describe dominant and recessive epistasis with suitable examples.

Or

Discuss the experiment conducted by Stern to demonstrate the cytological basis of crossing over.

5. Describe the different types of chromosomal aberrations.

Or

Explain any two important current methods of mutation detection.

6. Describe the normal inheritance of dextral and sinistral coiling in Limnaea showing maternal influence on its shell coiling.

(*Turn Over*)

Or

Discuss the sexual function of X and Y chromosomes in Drosophila.

7. Describe the mechanism of recombination in bacteria by conjugation method.

Or

Give an account of transposable elements.

GROUP – B

(OLD SYLLABUS)

(MOLECULAR BIOLOGY)

SECTION – A

1. Answer *all* questions in *four* to *five* sentences each : 2×6

(*a*) What are the replisome components ?

(*Continued*)

(*b*) What is an orisome ?

(*c*) What are exons ?

(*d*) Define RNA editing.

(*e*) What are repressors ?

(*f*) Explain gene silencing.

SECTION – B

Answer **all** questions : 12×4

2. Discuss the mechanism of DNA replication in Prokaryotes.

Or

(*i*) Structure of t-RNA

(*ii*) DNA denaturation.

3. Explain the mechanism of synthesis of m-RNA.

(*Turn Over*)

Or

(*i*) Light compass reaction

(*ii*) Imprinting.

4. Discuss the social organization in honey bees.

Or

(*i*) Formation of bee hives

(*ii*) Inclusive fitness.

5. Discuss the courtship behaviour in three spine stickle back.

Or

(*i*) Intra-sexual selection

(*ii*) Female choice.

5th Semester Examination, 2021

Time : 3 hours

Full Marks : 60

Answer any **one** Group as per your Syllabus

Answer from **all** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

GROUP – A

(MODEL SYLLABUS)

(ANIMAL BEHAVIOUR AND CHRONOBIOLOGY)

SECTION – A

1. Answer the following in *one* word or fill in the blanks : 1×8

(*a*) Yawning is an example of _____.

(*b*) Which dance is performed by bees when food source is very close to the hive ?

(*c*) Orientation response towards water current is _____.

(*d*) Mention the appropriate term in orientation mechanism in which an animal maintains a constant angle to a stimulus.

(*e*) The mating flight of honeybee is also known as _____.

(*f*) What is a collective group of bees called ?

(*g*) Which part of the human brain contains supra chiasmatic nuclei or a master circadian clock ?

(*h*) _____ is a biological process that occurs in living creatures over the period of approximately one year.

(*Continued*)

SECTION – B

2. Answer any *eight* of the following within *two* or *three* sentences each : $1\frac{1}{2} \times 8$

(*a*) What are some examples of innate behaviour ?

(*b*) What are releasers ?

(*c*) Differentiate between proximate and ultimate behaviour.

(*d*) What is an autonomic reflex arc ?

(*e*) What is an operant conditioning ? How does it work ?

(*f*) Mention the evolutionary significance of the sexual conflict in parental care.

(*g*) What are the different senses to communicate ?

(*h*) Why is mate selection important ?

(*Turn Over*)

(*i*) What is the adaptive significance of biological clock ?

(*j*) What is circadian synchronization ?

SECTION – C

3. Write short notes on any *eight* of the following within 75 words each : 2×8

(*a*) Code breakers

(*b*) Instinct

(*c*) Associative learning

(*d*) Habituation

(*e*) Bee foraging

(*f*) Sexual dimorphism

(*g*) Role of melatonin

(*h*) Biological oscillations

(*i*) Tidal rhythm

(*j*) Behaviour as a basis of evolution.

SECTION – D

Answer the following within **500** words each : 6×4

4. Give brief profiles of Karl von Frisch and Ivan Pavlov.

Or

Give an account of stimulus filtering in animal behaviour.

5. Describe the types and mechanism of reflex actions.

Or

How is imprinting different from other forms of learning ? Explain the work of Konrad Lorenz .

6. Give an account of social behaviour of honeybee.

Or

Write short notes on :

(*a*) Intersexual selection

(*b*) Altruism.

7. A zeitgeber is any environmental cue that entrains an organism's biological rhythm – expand the statement.

Or

Give a brief account on circadian rhythm.

GROUP – B

(OLD SYLLABUS)

(ANIMAL BEHAVIOUR)

SECTION – A

1. Answer *all* questions in *four* to *five* sentences each : 2×6

(*a*) What is the contribution of Ivan Pavlov ?

(*b*) What are code breakers ?

(*c*) What is Klinokinesis ?

(*d*) What is reciprocal altruism ?

(*e*) What are infanticides ?

(*f*) What is habituation ?

SECTION – B

Answer **all** questions : 12×4

2. Discuss instinct behaviour in animals.

Or

(*i*) Nico Tinbergen

(*ii*) Stimulus filtering.

3. Describe the characteristics of reflexes.

Or

Write short notes on :

(*a*) Intersexual selection

(*b*) Altruism.

7. A zeitgeber is any environmental cue that entrains an organism's biological rhythm – expand the statement.

Or

Give a brief account on circadian rhythm.

GROUP– B

(OLD SYLLABUS)

(ANIMAL BEHAVIOUR)

SECTION – A

1. Answer *all* questions in *four* to *five* sentences each : 2×6

(*a*) What is the contribution of Ivan Pavlov ?

(*b*) What are code breakers ?

(*c*) What is Klinokinesis ?

(*d*) What is reciprocal altruism ?

(*e*) What are infanticides ?

(*f*) What is habituation ?

SECTION – B

Answer **all** questions : 12×4

2. Discuss instinct behaviour in animals.

Or

(*i*) Nico Tinbergen

(*ii*) Stimulus filtering.

3. Describe the characteristics of reflexes.

Or

(*i*) Transgenic plant

(*ii*) DNA microinjection.

5. Discuss the role of recombinant DNA technology in medicine.

Or

(*i*) Cystic fibrosis

(*ii*) Animal cell culture.

5th Semester Examination, 2021

Time : 3 hours

Full Marks : 60

Answer any **one** Group as per your Syllabus

Answer from **all** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

GROUP – A

(MODEL SYLLABUS)

(IMMUNOLOGY)

SECTION – A

1. Answer in *one* word or fill in the blanks : 1×8

(*a*) _____ enzyme is responsible for synthesizing DNA from RNA in a retrovirus.

2020-21

Time : 3 hours

Full Marks : 60

The figures in the right-hand margin indicate marks.

*Answer from **all** the Groups as directed.*

Group – A

1. Fill in the blanks : 1×12 = 12

   (a) _____ is composed of two molecules of glucose.

   (b) Starch and _____ are storage polysaccharides.

   (c) Three fatty acids join by condensation with glycerol to form a _____.

(d) The bond between two amino acids is _____.

(e) Number of nitrogen atoms present in a purinal is _____.

(f) The differences in amino acids is due to their _____ groups.

(g) DNA differes from RNA in having thymine in place of _____.

(h) Length of one coil of DNA is _____.

(i) Apoenzyme and cofactor together constitute _____.

(j) The non-protein part of enzyme is called _____.

(k) Protein part of holoenzyme is _____.

(l) The single turn of DNA has _____ base pairs.

Group – B

2. Answer any **eight** questions in **two** or **three** sentences each : $1\frac{1}{2} \times 8 = 12$

(a) What do you mean by Emulsification ?

(b) What is Heparin ?

(c) Write importance of steroids.

(d) What do you mean by protein denaturation ?

(e) What are Nucleotides ?

(f) What do you mean by antiparallel ?

(g) What is cot curve analysis ?

(h) What is antisense RNA ?

(i) What is induced fit theory ?

(j) Write significance of enzyme inhibitors.

Group – C

3. Answer any **eight** questions within **75** words : 2×8 = 16

(a) Basic structure of immunoglobulins.

(b) Secondary structure of protein.

(c) Biological significance of cholesterol.

(d) Structure of tRNA.

(e) Coenzymes.

(f) Chemical nature of enzymes.

(g) Higher Nucleotides.

(h) Properties of fatty Acids.

(i) Glycoconjugates.

(j) Structural polysaccharides.

Group – D

4. Answer **all** questions : 5×4 = 20

Describe the structure and function of Lactose as disaccharide.

OR

What is phospholipids ? Discuss its features and significances.

5. What are amino acids ? Classify various types of amino acids.

OR

Decribe the various levels of organizations of protein.

6. Describe the different types of nitrogenous bases present in Nucleic Acids.

OR

Write a brief note on denaturation and renaturation of DNA.

7. What is reversible inhibition ? Write various types with examples.

OR

Describe the mechanism of regulation of enzyme action.

Or

Write notes on :

(*i*) Haematopoietic stem cells

(*ii*) Problems of IVF.

2020

(5th Semester)

Time : 3 hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(DEVELOPMENTAL BIOLOGY)

SECTION – A

1. Answer *all* questions in *four* to *five* sentences each : 2 × 6

(*a*) What is centrolecithal egg ?

(*b*) What part of a gastrula acts as a primary organizer and why ?

(*c*) What is implantation ? Mention the site of implantation in human being.

(*d*) Mention the fate of embryonic mesoderm.

(*e*) Define compensatory regeneration with example.

(*f*) Classify teratogens.

SECTION – B

Answer **all** questions : 12 × 4

2. Give an account of planes and patterns of cleavage. 12

Or

Write notes on :

(*i*) Spermiogenesis

(*ii*) Neural induction.

3. Briefly describe different types of placenta. Add a note on its functions. 12

Or

Write notes on :

(*i*) Structure of a placenta

(*ii*) Development and functions of allantois in birds.

4. Give a brief account of the hormonal regulations in amphibian metamorphosis. 12

Or

Write notes on :

(*i*) Epimorphosis

(*ii*) Models of ageing.

5. Describe the procedure, applications, advantages and disadvantages of Amniocentesis. 12

Or

Write notes on :

(*i*) Gene silencing

(*ii*) Trp Operon.

2020

(5th Semester)

Time : 3 hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(MOLECULAR BIOLOGY)

SECTION – A

1. Answer *all* questions in *four* to *five* sentences each : 2 × 6

(*a*) Name different nucleotides of DNA.

(*b*) What is cot curve analysis ?

(*c*) What are the different transcription factors ?

(*d*) What are split genes ?

(*e*) Mention the function of mi RNA.

(*f*) What is an inducible operon ?

SECTION – B

Answer **all** questions : 12 × 4

2. Describe the Watson and Crick model of DNA structure. 12

Or

Write notes on :

(*i*) DNA denaturation

(*ii*) Replisome.

3. Describe the process of protein synthesis in prokaryotes. 12

Or

Write notes on :

(*i*) Degeneracy of genetic code

(*ii*) Synthesis of r-RNA.

4. Describe the mechanism of RNA splicing. 12

Or

Write notes on :

(*i*) Exon shuffling

(*ii*) Structure of globin m-RNA.

5. Describe the factors and mechanism of transcription regulation in eukaryotes. 12

Or

Write notes on :

(*i*) Sexual conflict for male versus female parental care

(*ii*) Mate choice.

2020

(5th Semester)

Time : 3 hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(ANIMAL BEHAVIOUR)

SECTION – A

1. Answer *all* questions : 2 × 6

   (*a*) What is sign stimuli ?

   (*b*) What is the contribution of Konrad Lorenz ?

   (*c*) Define habituation with examples.

(*d*) What is the significance of Waggle dance ?

(*e*) What is Polyethism ?

(*f*) Explain evolutionary significance of asymmetry of sex.

SECTION – B

Answer **all** questions : 12 × 4

2. Discuss behaviour as a discipline of science and basis of evolution. 12

Or

Write notes on :

(*i*) Stimulus filtering

(*ii*) Brief profile of Ivan Pavlov.

3. What is Orientation ? Describe the phenomenon of orientation in animals. 12

Or

Write notes on :

(*i*) Reflex path

(*ii*) Associative learning.

4. Explain experiments to prove distance and direction component of dance learning ability in honey bee. 12

Or

Write notes on :

(*i*) Inclusive fitness

(*ii*) Types of honey bee.

5. Discuss the intra-sexual and inter-sexual selections, their causes and impact on animals. 12

Or

Write notes on :

(*i*) Application of r-DNA in medicine

(*ii*) Expression of cloned genes.

2020

(5th Semester)

Time : 3 hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(ANIMAL BIOTECHNOLOGY)

SECTION – A

1. Answer *all* questions in *three* to *four* sentences each : 2 × 6

(*a*) Differentiate between type-I and type-II restriction enzymes.

(*b*) What is northern blotting ?

(*c*) What is gene mapping ?

(*d*) Is it safe to eat GMO plant products ? And state why ?

(*e*) What is a cosmid vector ?

(*f*) What is complementary DNA library ?

SECTION – B

Answer **all** questions : 12 × 4

2. Describe in detail the concept and scope of biotechnology. 12

Or

Write notes on :

(*i*) Nomenclature of restriction endonucleases

(*ii*) Cloning Vectors.

3. Describe the techniques and applications of DNA fingerprinting. 12

Or

Write notes on :

(*i*) Southern blotting

(*ii*) Gene transfer by $CaCl_2$ method.

4. Describe the methods for nuclear transplantation. 12

Or

Write notes on :

(*i*) Herbicide resistant plants

(*ii*) Transgenesis.

5. Give a detailed account of establishment of cell cultures and evolution of cell lines. 12

SH ZOO–11

2019

(5th Semester)

Time : $2\frac{1}{2}$ hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(DEVELOPMENTAL BIOLOGY)

SECTION—A

1. Answer *all* the questions in *four* to *five* sentences : 2×6

(*a*) Distinguish between Area Opaca and Area Pellucida.

(*b*) What is Monospermy ?

(*c*) What is Meroblastic cleavage ?

(*d*) What are endocrine functions of placenta.

(*e*) Define Hensen's Node.

(*f*) What is amniocentesis ?

SECTION– B

Answer **all** questions :

2. Describe the major events that occur in the process of fertilization. 12

Or

Write notes on : 6 + 6

(*i*) Primitive streak

(*ii*) Organizer concept.

3. Describe the arrangement and mode of development of extra-embryonic membranes in chick and explain their functions. 12

Or

Write notes on : 6 + 6

(*i*) Deciduous and Non-deciduous placenta

(*ii*) Implantation.

4. Define Ageing. Discuss various theories of Ageing. 12

Or

Write notes on : 6 + 6

(*i*) Morphological metamorphic changes in tadpole

(*ii*) Epimorphosis and Morphallaxis.

5. What are stem cells ? Discuss their sources, types and application in human welfare. 12

Or

Write notes on : 6 + 6

(*i*) IVF technique

(*ii*) Teratogenic agents and their effects on embryonic development.

———————

SH ZOO–12

2019

(5th Semester)

Time : $2\frac{1}{2}$ hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(MOLECULAR BIOLOGY)

SECTION–A

1. Answer *all* questions in *four* to *five* sentences : 2 × 6

(*a*) What is central dogma ?

(*b*) What is anti-codon ?

(*c*) Define Polycistronic mRNA.

(*d*) Mention the role of DNA unwinding proteins.

(*e*) What is alternative splicing ?

(*f*) State the role of rRNA.

SECTION– B

Answer **all** questions : 12 × 4

2. Give a brief account of structure and different types of RNA found in cell. What role these RNA play in protein synthesis. 12

Or

Write notes on : 6 + 6

(*i*) DNA polymerases

(*ii*) Semi-conservative replication.

3. Explain in detail Prokaryotic transcription process. 12

Or

Write notes on : 6 + 6

(*i*) Triplet Codon

(*ii*) Initiation of Translation in Eukaryotes.

4. Discuss the mechanism of post-transcriptional processing of mRNA. Why processing is essential ? 12

Or

Write notes on : 6 + 6

(*i*) RNA splicing

(*ii*) RNA editing.

5. Describe in details the Lac operon in *E. Coli*. Discuss how it controls the activity of genes. 12

Or

Write notes on : 6 + 6

(*i*) RNA interference

(*ii*) Ribo-switches.

———————

SD ZOO–01

2019

(5th Semester)

Time : $2\frac{1}{2}$ hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(ANIMAL BEHAVIOUR)

SECTION – A

1. Answer *all* questions in not more than *two, three* lines : 2 × 6

(*i*) What is infanticide ?

(*ii*) What is Kin-selection ?

(*iii*) What is a conspecific ?

(*iv*) What is the role of parthenogenesis in Honey Bee ?

(*v*) What is Klinotaxis ?

(*vi*) What is operant conditioning ?

SECTION – B

Answer **all** questions : 12 × 4

2. Give an account of instinctive behaviour in animals. 12

Or

Write notes on : 6 + 6

(*i*) Behaviour as a basis of evolution (socio-biology)

(*ii*) Code breakers.

3. Explain Mechanism of imprinting. 12

Or

Write notes on : 6 + 6

(*i*) Classical conditioning

(*ii*) Kinesis.

4. Describe the social organization in Honey Bee. 12

Or

Write notes on : 6 + 6

(*i*) Reciprocal altruism

(*ii*) Hamilton's rule.

5. What is asymmetry of sex ? Give an account of causes of male rivalry and consequences of mate choice for female fitness. 12

Or

Write notes on : 6 + 6

(*i*) Sexual dimorphism and its advantage

(*ii*) Courtship behaviour in three spine stickle-back.

———————

Or

Write notes on : 6 + 6

(*i*) Media for animal cell culture

(*ii*) Sickle cell anemia and its molecular diagnosis.

SD ZOO—02

2019

(5th Semester)

Time : $2\frac{1}{2}$ hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(ANIMAL BIOTECHNOLOGY)

SECTION – A

1. Answer *all* questions : 2×6

(*a*) What is DNA finger printing ?

(*b*) Why *Agrobacterium tumefaciens* infects only dicot plants ?

(*c*) What do you mean by DNA microarray ?

(*d*) Write the applications of transgenic plants.

(*e*) Give the basic principle of Blotting techniques.

(*f*) What is cystic fibrosis ?

SECTION – B

Answer **all** questions : 12 × 4

2. Why Restriction enzymes are called as "molecular seissors" ? Mention the basic criteria for the nomenclature of Restriction enzymes. Give the properties of Type II Restriction Enzymes. 12

Or

Write notes on : 6 + 6

(*i*) Cloning vectors and its applications

(*ii*) Strategies for gene cloning.

3. What is polymerase Chain Reaction (PCR) ? Describe the mechanism of amplification of a desired DNA-segment of a genome. Give the

application of PCR-technique in the field of biotechnology. 12

Or

Write notes on : 6 + 6

(*i*) Construction of cDNA library

(*ii*) Electroporation.

4. What is Ti plasmid ? Describe the process of Agrobacterium mediated gene transformation in plants. 12

Or

Write notes on : 6 + 6

(*i*) Knockout mice

(*ii*) DNA microinjection.

5. What is gene therapy ? Mention the types of gene therapy. Describe the process of gene therapy. 12

Total Pages—4

SH ZOO-11

2018

(5th Semester)

Time : $2\frac{1}{2}$ hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(DEVELOPMENTAL BIOLOGY)

SECTION—A

1. Answer *all* questions in *four* to *five* sentences : 2×6

(*a*) What is Vitellogenesis ?

(*b*) Differentiate between involution and ingression.

(c) What is blastema ?

(d) What is Allantois ?

(e) Define genetic teratogenesis.

(f) Differentiate between Fertilizin and Antifertilizin.

SECTION–B

Answer all questions : 12 × 4

2. Describe early development of Frog upto completion of gastrulation. 12

Or

Write notes on : 6 + 6

(i) Egg Membranes

(ii) Role of Yolk on Cleavage.

3. Give an account of the morphological and histological types of placenta. Add a note on its physiological functions. 12

Or

Write notes on : 6 + 6

(i) Amnion and Chorion

(ii) Implantation of human embryo.

4. Discuss Morphological and Physiological changes which take place during metamorphosis of Amphibian larva. 12

Or

Write notes on : 6 + 6

(i) Histological events during regeneration

(ii) Cellular changes during ageing.

5. Enumerate the factors that influence the teratogenic effects of an environmental teratogen. 12

Or

Write notes on : 6 + 6

(*i*) IVF technique

(*ii*) Amniocentesis.

SH ZOO—12

2018

(5th Semester)

Time : $2\frac{1}{2}$ hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(MOLECULAR BIOLOGY)

SECTION – A

1. Answer *all* questions in *four* or *five* sentences : 2×6

   (*a*) State Chargaff's Base Ratio.

   (*b*) What is a primary transcript ?

   (*c*) What are Ribozymes ?

   (*d*) Define Wobble hypothesis.

   (*e*) What is miRNA ?

(f) What do you understand by DNA denaturation and renaturation ?

SECTION – B

Answer **all** questions : 12×4

2. Describe different steps involved in DNA replication in Prokaryotes. 12

Or

Write notes on : 6 + 6

(*i*) Clover leaf model

(*ii*) Biological significance of DNA.

3. Explain the process of initiation and elongation during translation in E. Coli. 12

Or

Write notes on : 6 + 6

(*i*) Essential features of Genetic code

(*ii*) Transcription.

4. Describe post-transcriptional modification of hnRNA in Eukaryotes. 12

Or

Write notes on : 6 + 6

(*i*) Split genes

(*ii*) RNA editing.

5. Define operon. Explain this concept with regard to Lac operon. 12

Or

Write notes on : 6 + 6

(*i*) Enhancers and silencers

(*ii*) Tryptophan operon.

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SD ZOO-01

2018

(5th Semester)

Time : $2\frac{1}{2}$ hours

Full Marks : 60

Answer from **both** the Sections as per direction

The figures in the right-hand margin indicate marks

Candidates are required to answer in their own words as far as practicable

(ANIMAL BEHAVIOUR)

SECTION—A

1. Answer *all* questions (in not more than *two*, *three* lines) : 2×6

   (*a*) What is code breaking ?

   (*b*) What is reflex ?

   (*c*) Describe Polyethism.

(*d*) What is the chromosomal composition of worker and Drove Honey bee ?

(*e*) Define orthokinesis.

(*f*) What is mnemotaxis ?

SECTION–B

Answer all questions : 12 × 4

2. Give an account of Innate behaviour patterns in animals. 12

Or

Write notes on : 6 + 6

(*i*) Ivon Pavlov

(*ii*) Proximate and ultimate behaviour.

3. Explain different types of learning behaviours. 12

Or

Write notes on : 6 + 6

(*i*) Reflex path

(*ii*) Taxes.

4. Give an account of Communications in honey bees. How the direction is communicated ? 12

Or

Write notes on : 6 + 6

(*i*) Hamilton's rule

(*ii*) Insects society.

5. Write the courtship behaviour in three spine stickle back. 12

Or

Write notes on : 6 + 6

(*i*) Infanticide in animals

(*ii*) Meta choice.
