2019

ZOOLOGY

(Major)

Paper : 6.1

(Animal Behaviour)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. *(a)* Choose the correct answer (any *four*) :

   $1 \times 4 = 4$

   (i) Defence organ of a soldier of white ant is

   (1) sting apparatus

   (2) powerful legs

   (3) mandibles

   (ii) Pollen baskets bearing individual of honeybee is called

   (1) queen

   (2) forager

   (3) drone

   (iii) The behaviour biologist Ivan P. Pavlov was designed an apparatus, popularly known Pavlov's apparatus to study the

   (1) classical conditioning

   (2) social behaviour of ants

   (3) operant conditioning

(*Turn Over*)

(iv) Sexual behaviour of an animal is controlled by

(1) lateral hypothalamus

(2) posterior hypothalamus

(3) anterior hypothalamus

(v) Pituitary hormone that controls drinking of an animal is

(1) antidiuretic hormone (ADH)

(2) adrenocorticotrophic hormone (ACTH)

(3) luteinizing hormone (LH)

(b) Fill in the blanks (any *three*) :   1×3=3

(i) Biological rhythms of 12·4 or 24·8 hours tide cycle is called _____ rhythm.

(ii) A method of rapid learning of the mother's appearance by newly hatched chicks is called _____.

(iii) The ability to solve complex problems through a series of trial-and error method is called _____.

(iv) An autonomic response established by training to an ordinarily natural stimulus is called _____.

2. (a) Write short notes on (any *two*) :   2×2=4

(i) Pheromone producing glands in honeybees

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(ii) Dances as a tool of communication in honeybees

(iii) Environmental factors responsible for habitat selection

(b) Differentiate between the following pairs (any *two*) : 2×2=4

   (i) Homing behaviour and territorial behaviour

   (ii) Classical conditioning and operant conditioning

   (iii) Reasoning and imprinting

3. Answer any *three* questions : 5×3=15

   (a) Discuss briefly the neuro-biological control of vocalization behaviour in birds. 5

   (b) What is a releaser? Write briefly the Innate Releasing Mechanism (IRM) in animals. 1+4=5

   (c) What do you mean by habitat selection? What are the factors responsible for dispersal from the place of birth? Explain briefly. 1+4=5

   (d) What is biological rhythms? Discuss various types of biological rhythms found in animals. 1+4=5

   (e) What is behaviour? Explain the patterns of behaviours in animals. 1+4=5

(Turn Over)

4. Answer the following questions :

(a) Define motivation. What are the distinguishing features of motivation? Discuss the role of hypothalamus in controlling the behaviour of animals.

1+4+5=10

Or

Define ethology. What are the importance of ethology? Discuss about the techniques of study of ethology.

1+2+7=10

(b) Explain the role of genes in shaping the behaviour of an animal. How genes affect the physiological basis of behaviour?

4+6=10

Or

What are the characteristics of a social organization? Discuss various types of social organizations found in monkeys.

2+8=10

(c) Define aggression. What are the different forms of aggressive behaviours? Explain the factors that regulates aggressive behaviour in animals.

1+3+6=10

Or

With suitable examples, explain various methods of communication found in animals.

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2019

ZOOLOGY

(Major)

Paper : 6.2

(Evolution and Adaptation)

Full Marks : 60

Time : 3 hours

*The figures in the margin indicate full marks
for the questions*

1. Choose the correct answer : 1×7=7

   (a) Hugo de Vries proposed the mutation
   theory based on his experiment
   conducted on

       (i) *Pisum sativum*

       (ii) *Drosophila melanogaster*

       (iii) *Oenothera lamarckiana*

       (iv) *Althea rosea*

   (b) Which of the following phenomenons
   supports Darwin's concept of natural
   selection in organic evolution?

       (i) Production of 'Dolly' sheep by
   cloning

       (ii) Development of organs from stem
   cells for organ transplantation

       (iii) Development of transgenic animals

       (iv) Prevalence of pesticide-resistant
   insect

(c) Evolution is studied on

   (i) individual

   (ii) species

   (iii) population

   (iv) cells

(d) What is the most important factor for the success of animal population?

   (i) Unlimited food

   (ii) Natality

   (iii) Interspecific activity

   (iv) Adaptability

(e) Which of the following shows common origin of man and chimpanzee?

   (i) Dental formula

   (ii) Binocular vision

   (iii) Similar cranial capacity

   (iv) Banding patterns in chromosome numbers 3 and 6

(f) Earliest fossil form in the phylogeny of horse is

   (i) Mesohippus

   (ii) Equus

   (iii) Eohippus

   (iv) Merychippus

    (g) Macroevolution is known as

        (i) genetic drift

        (ii) random selection

        (iii) adaptive radiation

        (iv) bottleneck's effect

2. Write short notes on the following :   2×4=8

    (a) Cryptic colouration in mimicry

    (b) Microevolution and megaevolution

    (c) Drawbacks of Darwin's theory

    (d) Major zoogeographical regions of the world

3. Answer/Write short notes on any *three* of the following :   5×3=15

    (a) Give an account on the fossil history of man.

    (b) Typical fauna of Oriental region and Australian region

    (c) Protective and aggressive mimicry

    (d) Primary and secondary aquatic adaptation

    (e) Characteristic feature of Mesozoic era

4. *(a)* Give an account on the nature and formation process of fossils. Enumerate the methods for the determination of age of fossils. How are fossils significant in the study of evolution?   4+4+2=10

Or

(b) Outline the different postulates of Lamarckism. How does it explain the elongation of neck of giraffe and absence of limbs in snakes and other burrowing animals? Mention the most controversial part of Lamarck's law of evolution. 5+3+2=10

5. (a) What was the view of A. I. Oparin for origin of life? Describe the Urey-Miller experiment. Discuss the importance of coacervates in the origin of life. 2+5+3=10

Or

(b) "Without isolation there is no speciation." Justify this statement. Explain the role of geographic and genetic isolation in speciation. 2+4+4=10

6. (a) Give an account of geological periods and indicate the group of animals characteristic of these periods. 10

Or

(b) Define adaptation. Show briefly how the organization of bird is adapted to meet the requirement of its life. Discuss evolutionary significance of adaptation. 2+6+2=10

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2019

ZOOLOGY

(Major)

Paper : 6.3

(Economic Zoology)

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks
for the questions

1. Fill in the blanks :   1×4=4

   (a) _____ silk of Assam is a Geographical
   Indication (GI) tag protected.

   (b) _____ is the scientific name of Golden
   Mahseer.

   (c) The partially fermented pollen mixture
   stored in the honeybee comb is known
   as _____.

   (d) *Spodoptera mauritia* is a pest causes
   severe damage to _____ crop.

(*Turn Over*)

2. Choose the correct answer :   1×3=3

(a) Apitoxin is a

(i) honeybee product

(ii) lac insect product

(iii) silkworm product

(iv) fish product

(b) Protozoan disease of silkworm is known as

(i) muscardine

(ii) pebrine

(iii) grasserie

(iv) flacherie

(c) The lac insect belongs to the order

(i) Lepidoptera

(ii) Hymenoptera

(iii) Orthoptera

(iv) Homoptera

3. Distinguish between the following (any *four*) :

2×4=8

(a) Waggle dance and Round dance of honeybee

(b) Kusumi lac and Rangeeni lac

(c) Mechanical and Cultural control of pest

(d) Captive and Culture fisheries

(e) Spinning and Reeling of silk

(f) Sterile diploid female bee and Fertile diploid female bee

(*Continued*)

4. Write short notes on the following (any *three*) : 5×3=15

(a) Freshwater prawn culture

(b) Diseases of silkworm

(c) Induced breeding of IMC by hypophysation

(d) Biological control of pests

(e) Lac culture

5. What is silk? Write an account of varieties of silk product and their economics in India.

2+8=10

Or

Describe the process of rearing of muga silkworm with the effect of environmental conditions. 5+5=10

6. What is nuptial flight? What are the roles of drone and worker honeybees in their colony? Mention the economic importance of honey.

1+6+3=10

Or

Define IPM. Give an account on the advantage and disadvantage of the use of pesticides. State the role of natural products in pest control. 2+4+4=10

7. What do you mean by aquaculture? Describe briefly about the composite fish culture.

2+8=10

Or

Discuss with suitable diagram about the construction and layout of ponds of a fish farm.

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ZOOLOGY

(Major)

Paper : 6.4

Full Marks : 60

Time : 3 hours

The figures in the margin indicate full marks
for the questions

GROUP—A

(Biotechnology)

1. Answer the following as directed : $1 \times 7 = 7$

   (a) _____ is a technique used to get information about the recognition sites on DNA.

                    (Fill in the blank)

   (b) Reverse transcriptase is an RNA dependent DNA polymerase.

                    (State True or False)

   (c) _____ are enzymes that decompose nucleic acids by cutting the phosphodiester bond.

                    (Fill in the blank)

                   (*Turn Over*)

(d) Ligase is used for

   (i) transduction

   (ii) replication

   (iii) cleaving DNA molecules

   (iv) joining DNA fragments

   (Choose the correct option)

(e) If linkers are combined with other features such as selectable marker, it is called

   (i) cassette

   (ii) adaptors

   (iii) induced linkers

   (iv) tracers

   (Choose the correct option)

(f) _____ is a separation technique that is based on the mobility of ions in an electric field.

   (Fill in the blank)

(g) The DNA polymerase isolated from the bacteria *Thermus aquaticus* is

   (i) T4 DNA

   (ii) Taq DNA

   (iii) Vent DNA

   (iv) topoisomerase

   (Choose the correct option)

2. Write brief notes on the following : 2×4=8

    (a) S1 nuclease

    (b) Difference between genomic DNA and cDNA

    (c) Plasmids

    (d) Electroporation

3. Answer any *two* of the following : 5×2=10

    (a) Write the functions of restriction endonuclease.

    (b) State the properties of a good cloning vector.

    (c) Write on the application of tissue culture.

    (d) Write on the various chemical methods of gene transfer.

4. Answer any *two* of the following : 10×2=20

    (a) Write in detail about the various culture media used in cell culture emphasizing on their advantages and disadvantages.

                                       4+3+3=10

    (b) What is gene cloning? Describe the various stages of gene cloning. 2+8=10

    (c) Describe in detail the microprojectile shotgun method of gene transfer. Indicate the advantages of the method.

                                       7+3=10

    (d) Describe the procedure of construction of cDNA library. 10

GROUP—B

(Bioinformatics and Computer Application for Biologists)

5. Write briefly on any *one* of the following :   5

   (a) Computer-aided technique for data presentation

   (b) Programming languages

6. What is an Operating System? Discuss the Windows Operating System.   2+8=10

   Or

   What is bioinformatics? Enumerate on the application of bioinformatics in today's world.   2+8=10

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