3 (Sem–6) ZOO M 1

2020

ZOOLOGY

(Major)

Paper : 6·1

(Animal Behaviour)

Full Marks : 60

Time : Three hours

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

1. *(a)* Choose the correct answer : ***(any four)*** 1×4=4

   (i) The term circadian rhythm was coined by B.F. Skinner/Franz Halberg/Karl von Frisch.

   (ii) The first biologist to identify sign stimuli was Konrad Lorenz/Saint-Hilaire/E.O. Wilson.

   (iii) The hierarchical model of motivation was proposed by Ivan Pavlov/Niko Tinbergen/E.L. Thorndike.

(iv) The term operant conditioning was coined by Sigmund Freud/B.F. Skinner/Konrad Lorenz.

(v) The meaning of waggle dance of bees was first decoded by Gilbert White/Karl von Frisch/Oskar Heinroth.

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

(i) The highest form of learning is _____ learning.

(ii) The circadian clock of mammals is located in the _____ of mammals.

(iii) The first pheromone to be discovered was _____.

(iv) Directed orientation reaction shown by animals to stimulation by oxygen is called _____.

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

(i) Vacuum activities

(ii) Alarm pheromones

(iii) Biological clock.

(b) Distinguish between : ***(any two)*** 2×2=4

(i) Ethological versus psychological approach to the study of behavior

(ii) Instinct and learning

(iii) Conditioned stimulus and unconditioned stimulus.

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

(a) What is meant by supernormal stimuli ? Give examples. 5

(b) Give *five* points of similarities between classical and instrumental conditioning. 5

(c) Describe briefly the figure of eight dance of honey bees. 5

(d) Mention the general properties of circadian rhythms in animals. 5

(e) What are the disadvantages of group living in animals ? Discuss. 5

4. Answer the following questions :

(a) Define ethology. Describe the various methods of sampling behavior. 2+8=10

Or

What is meant by stimulus filtering? Explain with suitable examples, how stimulus filtering occurs in animals. Comment on the advantages of stimulus filtering. 2+6+2=10

(b) What is ethoendocrinology? Discuss the effects of hormones on *any four* behavioural patterns of animals. 2+8=10

Or

What are models of motivation? With appropriate diagram, describe the Psychohydraulic model of motivation and comment on its drawbacks. 2+6+2=10

(c) Define territory. Explain how territories are defended by animals and add a note on the benefits of territorial behaviour. 2+4+4=10

Or

How does dispersal differ from migration? Give an account of the various means employed by animals to disperse and comment on the benefits of dispersal. 2+6+2=10

3 (Sem–6) ZOO M 2

2020

ZOOLOGY

(Major)

Paper : 6·2

(Evolution and Adaptation)

Full Marks : 60

Time : Three hours

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

1. Multiple choice questions : 1×7=7

(a) Homology does not refer to

(i) divergent evolution

(ii) common descent

(iii) convergent evolution

(iv) adaptive radiation

Contd.

(b) Peripatus is connecting link between

(i) Annelida and Mollusca

(ii) Annelida and Helminth

(iii) Annelida and Arthropoda

(iv) All of the above

(c) The modern synthetic theory of evolution is based on

(i) genetic and chromosomal mutation

(ii) genetic recombination and natural selection

(iii) reproductive isolation

(iv) All of the above

(d) Diversity in the beaks of finches adapted to different feeding habit on Galapagos islands as observed by Darwin, provides evidence for

(i) interspecific variation

(ii) intraspecific competition

(iii) origin of species by natural selection

(iv) intraspecific variation

(e) The non-directional force that alters Hardy-Weinberg equilibrium is

(i) gene flow

(ii) mutation

(iii) genetic drift

(iv) gene recombination

(f) Adaptation is a type of

(i) speciation

(ii) adaptive radiation

(iii) convergent evolution

(iv) divergent evolution

(g) Match and select the correct set :

	Set-I		Set-II
A.	Mesozoic	1.	First land vertebrates
B.	Devonian	2.	Proliferation of reptiles
C.	Palaeocene	3.	Raise of modern mammals
D.	Permian	4.	Radiation of primitive mammals
		5.	160 million years

(i) A = 5, B = 4, C = 3, D = 2

(ii) A = 5, B = 1, C = 4, D = 2

(iii) A = 5, B = 1, C = 2, D = 5

(iv) A = 5, B = 1, C = 4, D = 3

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

(a) Recapitulation theory

(b) Lateral line system in fish

(c) Mimicry and protective colouration

(d) Characteristics feature of Mesozoic era

3. Answer the following in brief : 5×3=15
(any three)

(a) What are the 'zoogeographical barriers'? How do these barriers affect the distribution of animals?

(b) Describe significance of Ramapithecus and Siwalika Hills with reference to human evolution.

(c) Write on the role of mimicry in evolution.

(d) Write evolutionary history in the origin of birds.

(e) Write on bottleneck effect and founder effect of genetic drift.

4. (a) Give an account of Darwin's theory of evolution. Discuss the theory in the light of modern researches. 5+5=10

Or

(b) Describe the Stanley Miller's experiment and explain how it proves the biochemical origin of life. 5+5=10

5. (a) Write an essay on the evidences in support of the theory of evolution as illustrated by embryology and comparative anatomy. 5+5=10

Or

(b) What is species? Explain the mechanism of speciation through isolation. 2+8=10

6. (a) Give an account of ancestry of horse incorporating the paleontological history of the modern horse. 5+5=10

Or

(b) Give an account of geological periods and indicate the groups of animals characteristic of those periods. 10

Total number of printed pages–4

3 (Sem–6) ZOO M 3

2020

ZOOLOGY

(Major)

Paper : 6·3

(Economic Zoology)

Full Marks : 60

Time : Three hours

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

1. Fill in the blanks : 1×4=4

   (a) The Eri silkworm *Samia ricini* (Donovan) belongs to the family _____.

   (b) _____ is the scientific name of Grass carp.

   (c) The name of the male caste of the honey bee is _____.

   (d) *Dicladispa armigera* is a pest, causes severe damage to _____ crop.

Contd.

2. Choose the correct answer : 1×3=3

(a) The biological name of tropical tasar silkworm reared in India is _____.

(i) *Antheraea assamensis*

(ii) *Antheraea proylei*

(iii) *Antheraea mylitta*

(iv) *Antheraea roylei*

(b) *Cyprinus carpio* is a/an

(i) ornamental fish

(ii) major carp

(iii) exotic carp

(iv) minor carp

(c) _____ is a unit of measurement that is used to determine the thickness of silk threads.

(i) DFL

(ii) Denier

(iii) Renditta

(iv) All of the above

3. Distinguish between the following : ***(any four)*** 2×4=8

(a) Inorganic insecticide and Organic insecticide

(b) Exotic carp and Indian major carp

(c) Physical and Cultural control of pest

(d) Eri cocoons and Muga cocoons

(e) Drone and Worker bee.

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

(a) Composite fish culture

(b) Environmental conditions in Muga silkworm rearing

(c) Integrated Pest Management

(d) Nature of Silk

(e) Economic importance of honey.

5. What is Chawki rearing ? Describe the host plants and rearing process of eri silkworm, *Samia ricini* (Donovan). 2+4+4=10

Or

Name the different diseases of silkworm. Write about their causes, symptoms and preventive measures. 2+2+3+3=10

6. What do you mean by language of honey bee? Describe the morphological characteristics and functions of different castes of honey bee colony. 2+4+4=10

Or

What is pest? Give an account on types of pests and importance of pest control. 2+8=10

7. What do you mean by Hypophysation? Describe briefly the process of Induced Breeding Technology of Indian major carp. 2+8=10

Or

What are Kusumi and Rangeeni lac? Describe about the different enemies and uses of lac. 2+4+4=10

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Total number of printed pages–4

3 (Sem–6) ZOO M 4

2020

ZOOLOGY

(Major)

Paper : 6·4

Full Marks : 60

Time : Three hours

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

GROUP – A

(Biotechnology)

1. Answer the following as directed : 1×7=7

(a) Which of the following is helpful in distinguishing DNA of one individual from another?

(i) PCR

(ii) Reverse Transcriptase

(iii) cDNA

(iv) RFLP

(b) What are primers?

(c) Klenow fragment is derived from :

(i) DNA Pol I

(ii) RNA Pol II

(iii) DNA ligase

(iv) Reverse Transcriptase

(d) Polyadenylation of RNA is an important criterion for production of cDNA. Which of the following statements is true ?

(i) Polyadenylation should be at 3' end.

(ii) Eukaryotic mRNAs are mostly non-polyadenylated.

(iii) Bacterial mRNAs and organelles mRNAs are polyadenylated.

(iv) It is carried out by the addition of T residues after synthesis.

(e) Which of the following is used as fusogen ?

(i) Polyethylene glycol

(ii) CaMV

(iii) Sendai virus

(iv) Adenovirus

(f) What is cell line ?

(g) Name the cell line of the human cervical carcinoma.

(i) HeLa

(ii) WISH

(iii) L

(iv) MRC-5

2. Write very brief answers of the following : 2×4=8

(a) State the application of PCR.

(b) Why is gene tagging done ?

(c) Differentiate between adherent culture and suspension culture.

(d) What are shuttle vectors ?

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

(a) Write a note on different types of restriction enzymes.

(b) Describe the particle gun method.

(c) State the bioethical issues in animal culture.

(d) Write on cell harvesting techniques.

4. Answer ***any two*** of the following :

(a) What is gene cloning ? Write in detail, the process of gene cloning. 2+8=10

Contd.

(b) Describe in some detail, the various strategies for the integration of DNA inserts into the vector. 10

(c) Describe the various types of artificial culture media used for cell culture. Explain the role of serum in the culture medium and discuss its disadvantages. 4+3+3=10

(d) Discuss the role of biotechnology in health care giving suitable example to support your views. 10

GROUP – B

(Bioinformatics and Computer Application for Biologists)

5. Write short note on ***any one*** of the following : 5

(a) MICROSOFT WINDOWS

(b) Advantages and disadvantages of Cloud Computing.

6. What is Bioinformatics ? Why is bioinformatics regarded as the brain of biotechnology ? 2+8=10

Or

What are programming languages ? Give examples of various programming languages used. 2+8=10