P - III (1+1+1) H/14

2014

ZOOLOGY (Honours)

Sixth Paper

(Biochemistry & Molecular Biology and Physiology)

Full Marks : 90 Time : Four Hours

The figures in the margin indicate full marks.

Illustrate your answer wherever necessary.

Group - A

(Biochemistry & Molecular Biology)

1. Answer any *four* questions : 2×4=8

(a) Draw the basic structure of an amino acid. 2

(b) What do you mean by single stranded DNA binding protein ? Give example. 1+1

(c) Define cloning vector with examples. 2

(d) What is iso electric point ? 2

(e) Write the functions of Vitamin A and Vitamin C. 2

(f) Mention the role of glucose-6-phosphatase in carbohydrate metabolism. 2

P.T.O.

2. Answer any *four* questions : 4×4=16

(a) Establish the relation between *Km* and [*S*] when $V_0 = \frac{1}{2} V \max$. 1½+2½

(b) Draw Fischer projection and Haworth projection of glucose molecule. 2+2

(c) What are ribonucleosides ? Give examples. Draw structural configuration of any one of them. 1+1+2

(d) Describe briefly the semiconservative mode of DNA replication with suitable diagram. 2+2

(e) Write a note on glycogenolysis or glycogenesis. 4

(f) Classify enzymes on the basis of mechanism of action with examples. 2+2

3. Answer any *two* questions : 10½×2=21

(a) Write short notes on :

(i) Split genes,

(ii) Transposons and

(iii) Selfish DNA. 3+4½+3

(b) Describe with suitable diagrams the phenomena of competitive and non competitive inhibitions of enzyme actions. Give at least one example in each cases. (3½+4)+3

(c) Describe briefly the steps occurring in the process of TCA cycle mentioning the enzyme involved in each steps. 6½+4

(d) Mention three genetic disorders in humans. State the genetic basis of the disorders with clinical features. Add a note on nucleotide excision repair of damaged DNA. 1½+6+3

Group - B

(Physiology)

4. Answer any *four* questions : 2×4=8

(a) Write two functions of haemoglobin. 2

(b) What are the factors affecting blood pressure. 2

(c) What do you mean by osmoconformers ? 2

(d) What is Bohr effect ? 2

(e) What is resting membrane potential ? 2

(f) Write the role of bile in fat digestion. 2

5. Answer any *four* questions : 4×4=16

(a) Represent graphically the waves of a normal ECG. 4

(b) Explain the phenomenon of "saltatory conduction" of nerve impulse with proper diagram. 2+2

P.T.O.

(c) Mention the role of lactase and sucrase in carbohydrate digestion. 2+2

(d) Name two anticoagulants and mention how these factors inhibit blood clotting. 2+2

(e) Write a note on "ABO" system of blood groups. 4

(f) Distinguish between osmolarity and osmolality. What do you mean by tonicity ? 3+1

6. Answer any *two* questions : 10½×2=21

(a) Describe the mechanism of contraction of skeletal muscle with clean diagrams. 5½+5

(b) Write the structure of HbA and draw its structural configuration. Explain various movements of muscles and bones during breathing. (3½+3)+4

(c) Write short notes on : (i) Digestion of protein, (ii) Anatomical structure of Kidney and (iii) Characteristics of cardiac muscle. 3½+3½+3½

(d) Explain various modes of temperature regulations in mammals. 10½

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ZOOLOGY (Honours)

Seventh Paper

Full Marks : 90 Time : Four Hours

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Group - A

(Vertebrate Endocrinology and Reproductive Biology)

1. Answer any *four* questions : 2×4=8

(a) Write the cause of acromegaly.

(b) What is vasopressin ? State its functions.

(c) Define trophic hormone. Give one example.

(d) Mention the general characteristics of a hormone.

(e) What do you mean by Zona fasciculata ? Name the hormone secreted from this tissue.

(f) Why pituitary gland is known as 'Master gland' ?

P.T.O.

2. Answer any *four* questions : 4×4=16

(a) Discuss the histology of endocrine Pancreas and mention the different types of hormones secreted from the gland.

(b) Describe the mechanism of hormone action on the membrane receptor and elaborate the role of cyclic AMP.

(c) Give an account of the cell elements of Pituitary gland.

(d) What endocrine factors are involved in mammary growth and lactation ?

(e) What is Grave's disease ? Discuss the symptoms of the disease.

(f) Discuss the physiological functions of mineralocorticoids and glucagon.

3. Answer any *two* questions : 10½×2=21

(a) State the hormonal regulation in oogenesis and spermatogenesis.

(b) Explain how the hormones of the adrenal cortex and anti diuretic hormones exert a regulatory control over sodium, potassium and water balance in the body of a man ?

(c) State the hormones secreted from anterior

pituitary. Describe the physiological role of anterior pituitary hormones. 2½+8

(d) Describe the process of hormonal regulation of blood sugar. 10½

Group - B

(Developmental Biology)

4. Answer any *four* questions : 2×4=8

(a) What is fate map ?

(b) What is spermiogenesis ?

(c) Give the characteristics of a Telolecithal egg.

(d) What is atretic follicle ?

(e) State the role of dorsal lip of plastopore.

(f) How cleavage differs from mitotic cell division ?

5. Answer any *four* questions : 4×4=16

(a) Describe the induction process in organiser.

(b) Draw a neat and well labelled diagram of a mammalian sperm.

(c) With examples show how yolk influence cleavage pattern ?

(d) What are the major events during gastrulation ?

P.T.O.

(e) Describe with diagram the Epitheliochorial and Haemochorial placenta.

(f) What do you know about *in vitro* fertilization ?

6. Answer any *two* questions : 10½×2=21

(a) What is organiser action ? Organiser action is best studied in the development of eye in Vertebrates — Discuss the phenomenon. 10½

(b) What is placenta ? Describe the formation of a placenta in any rodent. State its functions. 10½

(c) Define fertilization. Describe the biochemical events during fertilization with suitable diagrams. 7+3½

(d) Describe the organogenesis of brain in chick with proper diagrams. 6½+4

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ZOOLOGY (Honours)

Eighth Paper

Full Marks : 90 Time : Four Hours

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Group - A

(Evolution and Behaviour)

1. Answer any *four* questions : 2×4=8

   (a) What is sibling species ?

   (b) What is altruism ?

   (c) Define Hardy-Weinberg law.

   (d) What do you mean by parapatric speciation ?

   (e) Define β and γ taxonomy.

   (f) What is genetic drift / genetic polymorphism ?

2. Answer any *three* questions : 4×3=12

   (a) Write a short note on communication of animals by pheromones.

   (b) What is migration ? Why do birds migrate ?

P.T.O.

(c) What are fixed action patterns ? What is circadian rhythm ?

(d) Comment on 'Biological Species Concept'.

(e) Write short notes on 'Hot dilute soup' and 'thermal proteinoids'.

(f) Define gene frequency and genotype frequency.

3. Answer any *two* questions : 10×2=20

(a) Explain Stanley Miller's experiment to prove the biochemical theory of origin of life. What are coacervates and Microspheres ? 7+3

(b) Stating different palaeontological records, describe the evolutionary history of modern horse. 10

(c) Compare and contrast Mullerian and Batesian mimicry. Elucidate the evolutionary significance of mimicry. 8+2

(d) Describe the principles of zoological nomenclature pertaining to the "law of authorship" and "law of priority". 5+5

Group - B

(Environmental Biology and Toxicology)

4. Answer any *three* questions : 2×3=6

(a) Write two effects of arsenic toxicity in humans.

(b) What are carcinogens ? Give examples.

(c) What is standard deviation ?

(d) What are the major sinks of Co_2.

(e) Differentiate between acute and chronic toxicity.

5. Answer any *three* questions : 4×3=12

(a) What do you mean by mean, median and mode ? 4

(b) Define toxicants. Classify pesticides on the basis of chemical nature with examples. 1+3

(c) Explain the role of pesticides as toxic agents. 4

(d) What do you mean by Minamata disease and Itai-Itai Episode ? 4

(e) Write a short note on "forensic toxicology". 4

6. Answer any *two* questions : 10×2=20

(a) What are the major sources of air pollution ? Discuss the effects of air pollutants on plants and animals. 4+6

(b) What are the major causes of destruction of forests in India ? What measures should be taken for conservation of forests in our country ? 5+5

P.T.O.

(c) What do you mean by Environmental Impact Assessment (EIA) ? Describe the scope, objectives and methodology of EIA. 2+2+2+4

(d) Define acute toxicity. Describe method of evaluation of LC50/LD50 of a toxicant. Add a note on the factors affecting acute toxicity. 2+6+2

Group - C

(Applied Zoology)

Any *one* of the following divisions to be answered.

[Bioinformatics]

7. Answer any *two* questions : 2×2=4

(a) What is the function of Recycle bin folder in Windows ?

(b) What is E-mail ?

(c) What are LAN and IP address ?

8. Answer any *two* questions : 4×2=8

(a) Comment on the 'databases and information retrieval' in Bioinformatics.

(b) Draw a block diagram of a typical digital computer and show major components.

(c) What is the role of internet in information collection in Biology ?

[Industrial Zoology and Pest Management]

7. Answer any *two* questions : 2×2=4

(a) How many types of honey bees are found in India ? Mention their scientific names.

(b) Comment on 'Pebrine'.

(c) What measures may be taken to control *Leucinodes orbonalis* ?

8. Answer any *two* questions : 4×2=8

(a) State the chemical composition of silk.

(b) Mention the damages caused by *Leptocorisa acuta* or *Sitophilus oryzae*.

(c) Write a short note on bio-control of pests.

[Aquaculture]

7. Answer any *two* questions : 2×2=4

(a) Write the scientific name of two Estuarine fishes.

(b) What is integrated fish farming ?

(c) What is hypophysation ?

8. Answer any *two* questions : 4×2=8

(a) Comment on the artificial hormones and analogues used in induced breeding.

P.T.O.

(b) What do you mean by captive and culture fisheries ?

(c) Write about the important fish by-products.

[Medical Zoology]

7. Answer any *two* questions : 2×2=4

(a) What is hydatid cyst ?

(b) What are microfilariae ?

(c) What is parasitoid ? Give example.

8. Answer any *two* questions : 4×2=8

(a) Describe with diagram, the trophozoite stage of *Entamoeba histolytica*.

(b) Discuss the pathogenicity and control measures of *Leishmania donovani*.

(c) What are the clinical symptoms of falciparum malaria ?

[Biotechnology]

7. Answer any *two* questions : 2×2=4

(a) What are the functions of Restriction endonucleases ?

(b) What are Plasmids ?

(c) Write the importance of DNA finger printing.

8. Answer any *two* questions : 4×2=8

(a) Briefly describe the process of PCR.

(b) What are the applications of recombinant DNA technology ?

(c) Comment on 'Ethical issues in Biotechnology and biosafety regulation'.
