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ZOOLOGY (Honours)

SIXTH PAPER

(Biochemistry, Molecular Biology
and Physiology)

(Revised New Syllabus)

Time : 4 hours   *Full Marks* : 90

The figures in the margin indicate full marks.

GROUP—A

1. Answer **all** the questions : $2 \times 4 = 8$

    (a) What is meant by mutarotation?

    (b) What is peptidyl transferase?

    (c) What is SOS response?

    (d) Give two examples of aromatic amino
         acids.

2. Answer any **three** of the following : $4 \times 3 = 12$

    (a) Establish the relation between K_m and
         [S] when $V_0 = \frac{1}{2} V_{max}$.

(*Turn Over*)

(b) Differentiate between starch and glycogen.

(c) Distinguish between prokaryotic and eukaryotic transcription.

(d) "Some transposable elements are selfish." Explain.

(e) Distinguish between saturated and unsaturated fatty acids.

Answer any **three** of the following :   10×3=30

(a) Give an account of sequence of reactions in pentose phosphate pathway and mention the significance of the pathway.   7+3

(b) Classify amino acids on the basis of R-groups.   10

(c) What is thymine dimer and how is it formed? Mention the different DNA repair mechanisms. Describe the process of mismatch repair.   3+2+5

(d) What is meant by gene therapy? Write the steps involved in *ex vivo* gene therapy. Comment on the demerits of gene therapy.   2+5+3

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GROUP—B

4. Answer **all** the questions :   2×4=8

(a) Why is urine acidic in nature?

(b) What is the role of bile in digestion of food?

(c) What is pacemaker?

(d) Name four respiratory pigments found in animals.

5. Answer any **three** of the following :   4×3=12

(a) What is Bohr's effect? Give its significance.

(b) Mention the basic principles of ECG.

(c) What is sodium pump? Mention its importance.

(d) Distinguish between osmoregulators and osmoconformers with example.

(e) Describe the breathing mechanism in mammals.

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

(a) Mention the physiological properties of heart muscles. Describe the mechanism of contraction of heart muscles.   4+6

(b) What is metabolism? Describe the biochemical events that lead to the digestion of proteins in small intestine.   2+8

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(c) What is resting membrane potential? How is action potential generated and transmitted along the axon? 2+8

(d) Write on the thermoregulatory devices developed by the homeotherms to maintain constant body temperature. Discuss the role of hypothalamus in regulating body temperature. 5+5

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ZOOLOGY (Honours)

SEVENTH PAPER

(Vertebrate Endocrinology, Reproductive Biology, Developmental Biology)

(Revised New Syllabus)

Time : 4 hours   *Full Marks* : 90

The figures in the margin indicate full marks.

GROUP—A

1. Answer **all** the questions :   2×4=8

(a) Define neurotransmitter. Give an example.

(b) What do you mean by hormone replacement therapy (HRT)?

(c) What is relaxin? State its function.

(d) Give the name of hormones secreted from the neurohypophysis.

Answer any **three** of the following : 4×3=12

(a) Write the site of secretion and function of cholecystokinin.

(b) Distinguish between hormone and enzyme.

(c) Write the role of zona pellucida protein in fertilization.

(d) Describe briefly the control of oestrogen secretion.

(e) What is ACTH? Write its function.

Answer any **three** of the following : 10×3=30

(a) What are T_3 and T_4? Which one is biologically more active? Write a note on their secretion. Explain how different factors influence the secretion of thyroid hormones. 2+1+2+5=10

(b) Describe the histological structure of adrenal cortex. Write chemical structure of testosterone and mention its physiological functions. 4+2+4=10

(c) Distinguish between oestrous cycle and menstrual cycle. State the role of different sex hormones in maintenance of the oestrous cycle. 3+7=10

(d) Describe the process of egg activation after fertilization. Give a note on *in vitro* fertilization. 7+3=10

(e) Describe the histological architecture of endocrine pancreas. Write a note on antagonistic role of insulin and glucagon. 4+6=10

GROUP—B

4. Answer **all** the questions : 2×4=8

(a) What is Grey crescent?

(b) State the roles of amnion and chorion.

(c) Write the name of acrosomal enzymes.

(d) Distinguish between vitellogenin and vitellin.

5. Answer any **three** of the following : 4×3=12

(a) What is fate map of an embryo? Mention its utility.

(b) Give an account of placental types.

(c) State the types and functions of egg membranes.

(d) Distinguish between epiboly and emboly with suitable diagrams.

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

(a) Distinguish between primary neurulation and secondary neurulation. With suitable diagram, describe the process of formation of neural tube in chick. 2+(5+3)=10

(b) Describe the sequential development of extraembryonic membranes in chick. Mention the role of placenta in development. 6+4=10

(c) State the difference in meiosis of spermatogenesis and oogenesis. How primary oocyte resumes meiosis overcoming deplotene arrest? 4+6=10

(d) What is metanephrogenic mesenchyme? How is it formed and developed into kidney tubules? Give an outline of reciprocal induction in kidney development. 1+4+5=10

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ZOOLOGY (Honours)

EIGHTH PAPER

(Evolution and Behaviour, Environmental Biology and Toxicology and Applied Zoology)

(Revised New Syllabus)

Time : 4 hours   Full Marks : 90

The figures in the margin indicate full marks.

GROUP—A

1. Answer **all** the questions :   2×4=8

   (a) Define Hardy-Weinberg law.

   (b) What is mutation pressure?

   (c) What is phylogenetic systematics?

   (d) Define circadian rhythm.

2. Answer any **three** of the following :   4×3=12

   (a) Discuss the significance of mimicry.

(b) Mention a few applications of behavioural studies.

(c) Write a brief note on the contribution of polyploidy in evolution.

(d) Briefly explain antipredatory behaviour.

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

(a) Discuss, in brief, the 'Natural Selection' as envisaged by Darwin.

Are the variations and mutations same? Explain. 5+5=1

(b) Deduce the Hamilton's rule of genetic relatedness with proper explanation. Explain the term altruism with suitable example. 6+4=1

(c) Define random genetic drift with example. Discuss the effect of genetic drift in evolution. 3+7=1

(d) What is biological clock? Give a brief idea about location of biological clock in animals. Comment on the adaptive significance of biological rhythm.

2+4+4=10

GROUP—B

4. Answer **all** the questions : 2×3=6

(a) What is CO_2 sink?

(b) Define xenobiotics.

(c) What do you understand by LD_{50}?

5. Answer any **three** of the following : 4×3=12

(a) Distinguish between primary and secondary air pollutants.

(b) Name the aspects those come under toxicology.

(c) When do you require to apply T-test and chi-square?

(d) Write a short note on hepato-toxicant.

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

(a) Write an essay on Greenhouse effect. 10

(b) Briefly discuss regarding the conservation of natural resources. 10

(c) Describe the sources of water pollution and comment on its adverse effects.

5+5=10

(d) Name two human toxicants and discuss about their regulatory mechanisms. 10

(4)

GROUP—C

Answer from *any* **one** of the following specializations :

(Bioinformatics)

7. Answer any **two** of the following : 2×2=

   (a) What is RAM?

   (b) Mention the difference between CD and DVD.

   (c) What is LAN?

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

   (a) Comment on different types of files.

   (b) Write a short note on internet explorer.

   (c) What is the meaning of "#" in C programming and its function?

   (d) Write a short note on two international data bases used in life science available through internet.

(Industrial Zoology and Pest Management)

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

   (a) Define polyphagous pest with example.

   (b) Name the commercially important species of honeybees.

   (c) What is voltinism?

   (d) What is heterosis?

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8. Answer any **two** of the following : 4×2=8

   (a) What are the essential requirements of rearing house of silkworm?

   (b) State the principle of IPM.

   (c) Write the composition of a processed cattle feed.

   (d) Enlist important protozoan diseases with symptoms and causative agents in poultry.

(Aquaculture)

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

   (a) What is Lingha Pearl?

   (b) What do you mean by weed fishes?

   (c) What is mariculture?

   (d) Name two commercial catches of mackerel.

8. Answer any **two** of the following : 4×2=8

   (a) What are the demerits of composite fish culture?

   (b) Mention the process of making pituitary extract.

   (c) Mention the importance of BOD in aquaculture.

   (d) Write a short note on finfishes.

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(Medical Zoology)

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

(a) What do you mean by microbes?

(b) Define transport host.

(c) Give the scientific name of smallest cestode.

(d) What is biological control of mosquito?

Answer any **two** of the following : 4×2=8

(a) How does a parasite differ from a pest?

(b) What do you mean by immunity in parasitic infection?

(c) Describe the pathogenicity and control of *Plasmodium falciparum*.

(d) Describe the clinical symptoms of dengue fever.

(Biotechnology)

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

(a) What is a promoter?

(b) What is probe?

(c) What is shuttle vector?

(d) What is RFLP?

8. Answer any **two** of the following : 4×2=8

(a) Write a note on liposome-mediated gene transfer.

(b) Write a short note on cosmid.

(c) Write a short note on Northern blotting.

(d) Illustrate features of a suitable expression vector.

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