

COMBINED COMPETITIVE EXAMINATION (MAIN)

ZOOLOGY

Paper—II

Time : 3 hours

Full Marks : 200

- Note :** (1) The figures in the right-hand margin indicate full marks for the questions.
(2) Attempt **five** questions in all.
(3) Question No. 1 is compulsory.
(4) Suitable diagrams may be drawn, wherever required.

1. Answer any ten of the following :

4×10=40

- (a) Differentiate between euchromatin and heterochromatin.
- (b) Define mitotic cell division and meiotic cell division.
- (c) Give one example each of (i) carbohydrate, (ii) protein, (iii) lipid and (iv) vitamin.
- (d) Compare between the processes of blastulation and gastrulation.
- (e) Write in brief the structure and function of haemoglobin.
- (f) Distinguish between resting potential and action potential.
- (g) Differentiate between a hormone and a pheromone.
- (h) Distinguish between an antigen and an antibody.
- (i) Mention the sources of (i) gonadotropin releasing hormone, (ii) calcitonin, (iii) glucagon and (iv) aldosterone.
- (j) Write briefly about the functions of placenta.
- (k) Distinguish between species and sub-species.
- (l) Give an example each of (i) glucocorticoid hormone, (ii) progestogen, (iii) androgen and (iv) estrogen.

2. Answer any *eight* of the following :

5×8=40

- (a) Write briefly about different types of white blood cell.
- (b) Compare between DNA and RNA of eukaryotes.
- (c) Give a brief account of the functions of eukaryotic gene.
- (d) Distinguish between transcription and translation.
- (e) Differentiate between skeletal muscle and smooth muscle.
- (f) Write briefly about normal and abnormal karyotypes.
- (g) Compare between glycolysis and gluconeogenesis.
- (h) Write briefly about the process of regeneration and its significance.
- (i) Give a brief account of zoogeographical realms.
- (j) What is enzyme? Write in brief about different types of enzyme.

3. Answer any *five* of the following :

8×5=40

- (a) Write briefly about the mechanism of blood coagulation.
- (b) What are the principles of classification of animal?
- (c) Enlist hormones of thyroid and parathyroid and their functions.
- (d) Write in brief about different types of placenta in mammals.
- (e) Briefly describe the role of organizers during organogenesis.
- (f) What is the fate of embryonic membranes in chick?
- (g) Explain cytoplasmic inheritance.

4. Answer any *four* of the following :

10×4=40

- (a) Briefly mention different phases in mitotic cell division.
- (b) What is aging? Elaborate consequences of aging in human.
- (c) What is balanced diet? Write in brief about the important components of a balanced diet.
- (d) Briefly explain the process of spermatogenesis.
- (e) Explain the process of vision.
- (f) Give a brief account of the principles and theories of continental distribution of animals.

5. Answer any *two* of the following :

20×2=40

- (a) Briefly describe different phases of meiotic cell division. Explain, why meiotic division is also called as reduction division.
- (b) What is transcription? Briefly explain the process of transcription in eukaryotes.
- (c) Describe the mechanism of action of a peptide hormone via cAMP leading to gene activation.

6. Answer any *four* of the following :

10×4=40

- (a) Write briefly about the Watson-Crick model of DNA structure.
- (b) Enlist pituitary hormones and their functions.
- (c) Briefly explain the role of hormones in metamorphosis and development of insects.
- (d) Give brief description of cellular immunity and humoral immunity.
- (e) Compare between oogenesis and spermatogenesis.

7. Answer any *two* of the following :

20×2=40

- (a) Describe the structure of mitochondria. Discuss the tricarboxylic acid (TCA) cycle with special reference to oxidative enzymes.
- (b) What is mutation? Mention different types of mutation. Write briefly about the role of mutations in evolution.
- (c) What is oxidative phosphorylation? Briefly describe the process of ATP formation via electron transport chain.

8. Write short notes on the following :

10×4=40

- (a) Chromosomal aberrations
- (b) Genetic code
- (c) Darwin's theory of evolution
- (d) Neural regulation of breathing

9. Discuss in detail about the following : 8×5=40
- (a) Structure of nucleus and nucleolus
 - (b) Mendelian laws of inheritance
 - (c) Steroid hormones
 - (d) Role of pancreas in digestion of food
 - (e) Metamorphosis in frog
10. Briefly explain the following : 4×10=40
- (a) Role of ribosomes in protein synthesis
 - (b) Importance of blood groups in blood transfusion
 - (c) Sex chromosomes and sex determination
 - (d) Genetic disorders
 - (e) Types of carbohydrate
 - (f) Mechanism of enzyme action
 - (g) Temperature regulation in man
 - (h) Impulse conduction across synapse
 - (i) Photoperiodic regulation of diurnal rhythm of melatonin
 - (j) Organogenesis of kidney
