

2021

ZOOLOGY

PAPER-II

Time Allowed — 3 Hours

Full Marks — 200

If the questions attempted are in excess of the prescribed number, only the questions attempted first up to the prescribed number shall be valued and the remaining ones ignored.

Answer may be given either in English or in Bengali but all answer must be in one and same language.

Group-A

1. Answer any ten questions.

4×10=40

- Define peptide bond and its significance.
- Mention the components required for DNA replication in a prokaryote system.
- Write notes on GERL.
- Write notes on numerical variation of chromosomes.
- Write notes on multiple allele.
- Describe the open chain form and closed ring form of glucose.
- Add a note on impact of coloration in mimicry.
- Mention the importance of 'Deep litter' system of poultry keeping.
- Explain the methods used for reeling and extraction of silk fibre from cocoon.
- Mention the role of sigma factor and Rho factor in prokaryotic transcription.
- Write short note on Bidirectional DNA replication.
- How polyspermy is prevented?
- Mention the role of Haemoglobin in oxygen transport.
- Write a short note on Cytokines.
- Discuss briefly the pathogenesis of lymphatic filariasis.
- Discuss on IVF.

Group-B

Attempt any four questions.

2. Explain the role of the membranous components of Golgi complex in transport of proteins. Describe the ultrastructure of mitochondrial cristae. Explain briefly the 'facilitated diffusion' through plasma membrane. Write the principle of ELISA technique. 5+5+5+5=20

3. Describe Meselson and Stahl experiment to prove replication is semiconservative. State the role of the attenuator in the regulation of tryptophan operon. Write notes on Hairpin termination in transcription. 10+5+5=20

4. (a) Two normal looking *Drosophila* are crossed and yield the following phenotypes among the progeny.

Females: +++ - 2000

Males:

+++ - 3

abc - 1

+bc - 830

a++ - 835

ab+ - 85

++c - 91

a+c - 80

+b+ - 75

4000

Give parental genotypes, gene arrangement, map distances and the coefficient of coincidence.

- (b) "Pseudoalleles are not true alleles but are the members of a complex locus"- explain with suitable examples.

- (c) Write notes on TLC. 10+4+6=20

5. (a) Contrast the role of cyclin-dependent kinase (cdk) during the cell cycle.

(b) Elaborate 'one gene one polypeptide concept' in the light of sickle cell anaemia.

(c) Write notes on 'Alternate splicing'.

- (d) What is DNA fingerprinting? 6+6+6+2=20

6. (a) Write notes on Sertoli cells and Leydig cells.

(b) How the adrenal cortical cells are stimulated to secrete aldosterone?

(c) State the histology of endocrine pancreas with diagram.

- (d) State types of diabetes with their etiology. 5+5+5+5=20

7. (a) State briefly the roles of corpora allata and corpora cardiaca in insect metabolism.

(b) Describe the different steps involved in biosynthesis of thyroxine.

(c) Describe the molecular basis of action of steroid hormone.

- (d) What is troponin complex? Discuss the role of Actin in muscle contraction. 5+5+5+5=20

Group-CAttempt *any four* questions.

8. (a) Explain the phenomenon of induction in development of eye in a vertebrate.
(b) Write notes on amnion and allantois.
(c) Discuss the role of primitive streak in gastrulation of chick.
(d) What is industrial melanism? Explain it taking *Biston betularia* as an example. 5+5+5+5=20
9. (a) Explain Neutral theory.
(b) Write notes on coacervates.
(c) Discuss the procedure for the preparation of pituitary extract.
(d) Briefly discuss the scientific method of apiculture. 5+5+5+5=20
10. (a) Discuss about the components and working principles of ecohatchery for the production of fish seed.
(b) Mention different steps and limitations of IPM.
(c) Describe a standard Langstroth's box used in bee keeping. 8+6+6=20
11. (a) Describe the life history of *Wuchereria bancrofti* and discuss the reasons of periodicity of microfilariae in the blood of man.
(b) Draw and describe T-cell receptor. What do you mean by 'immunological evasion' and 'zoonosis'? 10+(4+6)=20
12. (a) Give a brief idea on the antigen-antibody reaction in human body.
(b) How is nectar changed into honey? Comment on the chemical composition and economic importance of bee wax.
(c) Mention the factors responsible for successful induced breeding of fish.
(d) Give a short account on the biology, nature of damage of jute pest. 5+5+5+5=20
13. (a) Discuss various types of Natural selection as explained in synthetic theory.
(b) In what way Urey-Miller experiment enriched the chemical basis of origin of life?
(c) Characterise Shahiwal and Gir breeds of cattle and name their place of availability.
(d) Illustrate RNA world hypothesis. 6+4+6+4=20
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