

2022

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 (4x10=40)
- Explain midblastula transition?
 - What is decidua basalis?
 - What is IS element?
 - Define insertion and replacement vector
 - Enumerate the role of "rho factor" in prokaryotic transcription.
 - What is hyperchromic shift in DNA?
 - What is scotopic vision?
 - State the role of pyridoxal phosphate in transamination.
 - State the role of ATM and ATR in cell cycle check points
 - Bacteriophage is a beneficial virus-Justify
 - What is PKDL? Mention its symptoms.
 - What are oligophagus and polyphagus pest?

Group-B

Answer any four questions

2. Distinguish between: (5X4=20)
- R state and T state of haemoglobin
 - Complementation and recombination

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c. nullisomy and monosomy

d. Osmoregulator and Osmoconformer.

3. Write short notes on the following:

(5X4=20)

a. Podocytes

b. Write short note on ADA-SCID and gene augmentation therapy

c. Role of TMAO in osmoregulation

d. Saponification number

4. Describe the histology of typical graafian follicle in mammal with a labelled diagram. Write a note on hormonal influences on insect diapause. Distinguish the mechanism of action of steroid hormone and protein hormone.

(10+5+5=20)

5. Explain the effects of pH and temperature on enzyme activity. Digits of an EC number has specific significance- Justify the statement with example. What happens when $[S] = K_m$ and $[S] > K_m$ in enzyme substrate reaction. Explain with examples of feedback inhibition and competitive inhibition.

(5+5+5+5=20)

6. Define insertion and replacement vector. What is hypopolymer tailing in RDT? How does histone acetylation control gene expression? Explain chimeric DNA and RNA editing. Briefly describe the positive control of Lac Operon.

(4+3+3+5+5= 20)

7. If the G-C content of a DNA molecule is 56% what are the percentages of four bases (A, T, G, and C)? Explain dicentric bridge and paracentric inversion. "Sxl gene acts as a master regulator in Drosophila sex determination process" – Justify. Describe briefly the process of capping, splicing, and polyadenylation of hnRNA.

(5+5+5+5=20)

Group-C

Answer any four questions

8. Distinguish between:

(5X4=20)

a. Dexiotropic cleavage and Laetropic cleavage

b. Gene frequency and genotype frequency

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- c. Hapten and epitope
 - d. Breeding hapa and hatching hapa
9. Write short notes on the following: (5X4=20)
- a. IVF
 - b. Mitochondrial bottle neck
 - c. Role of Adjuvants in T Cell activation
 - d. Zoonosis

10. Describe with labelled diagrams the acrosome reaction that occurs in mammals. Write note on prevention of polyspermy during fertilization. Delineate briefly the development of eye in chick with special reference to lens formation and add a note on the major inductive events that occur during the process.

(5+5+10 =20)

11. Explain the role of migration affecting Hardy-Weinberg equilibrium. How would you calculate heterozygosity of a population? Illustrate the xeric adaptation of camel for thermoregulation.

Explain cryptic colouration. Describe a technique of fossil dating.

(5+3+5+4+3=20)

12. "Man can stand erect while anthropoid apes cannot". Discuss the anatomical changes that occur in man due to erect posture.

(10)

13. Write a note on pathogenicity of the disease conditions caused by Plasmodium falciparum. Give a schematic diagram to show different developmental stages of this parasite within the hepatocytes and RBC. What is obstructive filariasis? Give a brief idea on the life cycle of the causative organism.

(5+5+5+5 =20)

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