

Time Allowed : 3 Hours

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.

Answers may be given either in English or in Bengali but all answers must be in one and the same language.

GROUP - A

Answer any ten questions

1. a) What is GERL? State its function.
- b) What is Bombay phenotype?
- c) State criss-cross mode of inheritance with an example from human.
- d) Discuss catabolite repression.
- e) State Origin and Symptoms of albinism.
- f) Delineate two cell theory of sex-steroid biosynthesis.
- g) State the histological structures of adrenal cortex.
- h) Distinguish between Bohr's effect and Haldane effect.
- i) Discuss R - and T - State of haemoglobin.
- j) State the principle of PCR.
- k) State the role of cortical granules in prevention of polyspermy.
- l) Discuss biological control of pests. 4x10
- m) State principles of vaccination.

GROUP - B

Answer any four questions

2. a) Discuss distribution of marker enzymes in different mitochondrial compartments. 8
- b) Discuss the ultra structure of mitochondrion. State its role in ATP generation. 7+5
3. a) Classify eukaryotic chromosomes based on position of centromere. Discuss the nucleosome model of chromatin. 4+6
- b) What is MPF? Discuss the steps of cell-cycle progression from G1 to M-phase. 2+8
4. a) Discuss in brief the Prokaryotic transcriptional initiation complex. 10
- b) Discuss 5'- capping of Pre-mRNA mentioning the enzymes involved. 5
- c) Describe primary sex-determination mechanism in man. 5
5. a) What do you mean by operon concept? Discuss regulation of trp-operon by attenuation mechanism. 2+8
- b) Discuss GPCR pathway of hormone action. What are GEF and GAP? 6+4
6. a) State the major cell-types of anterior pituitary. Mention the major hormones secreted by them mentioning target sites. 6+4
- b) State the principle of cloning. Discuss the process of transgenic animal production from embryonic stem cells. 4+6

7. a) Differentiate between :
- i) PCR and cloning
 - ii) Proto-oncogene and tumor-suppressor gene. 5x2
- b) Make notes on :
- i) Urea Cycle.
 - ii) Role of haemoglobin in O₂-transport. 5x2

GROUP - C

Answer any four questions

8. Differentiate between :
- a) Induction and Competence.
 - b) Holoblastic and neuroblastic cleavage.
 - c) BCR and TCR.
 - d) Batesian and Mullerian mimicry.
 - e) Primary and secondary adaptive features of aquatic vertebrates. 5x4
9. Give notes on :
- a) Antigen - antibody reaction.
 - b) Range, climate and faunal of Ethiopian and Neo-tropical realms.
 - c) T-Cell and B-Cell co-operation.
 - d) Biogemy. 5x4
10. a) State the causative agent, life-cycle, pathogenicity and symptoms of Kala-a-Zar. 2+5+3+3
- b) Enlist the major adaptive features for volant mode of life in birds. 7
11. a) Briefly discuss the process of spermiogenesis. 10
- b) What are Hardy-Weinberg limitations? Calculate the number of carrier albino persons when the frequency of albino phenotype is 4 out of 40,000 individuals? 5+5
12. a) State composition and uses of Silk. 6
- b) State the causative agents, symptoms and remedial measures of pebrine and flacherie diseases of Silk moth. 2+4+4
- c) Add a note on functions of Cytokines. 4
13. a) Compare the gastrulation Process in frog and Chick. 5
- b) "Eye-development is the consequence of repeated reciprocal induction events" - Explain 8
- c) State the role of complements in MAC formation. 7