

M.Sc.

2014

2nd Semester Examination

ZOOLOGY

PAPER—ZOO-203

Full Marks : 40

Time : 2 Hours

The figures in the right-hand margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Illustrate the answers wherever necessary.

Answer all questions of the following.

(Group-A)

(Molecular Biology)

1. Answer any *two* questions of the following : 2×2
- (a) What is the role of nus A protein ?
 - (b) Which one is the most predominant RNA in eukaryotes on percentage basis? Name the type(s) of RNA polymerase(s) that synthesize them.
 - (c) Which amino acid is bound to seryl t-RNA^{Leu} ?

(Turn Over)

(d) Mention the function of TF II H to form open complex in promoter.

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

(a) In lae^{-d}/lae^{+} partial diploid, *lae* enzymes synthesized constitutively even in presence of normal repressor. Explain.

(b) Describe schematically the initiation process during prokaryotic translation.

(c) How does end replication problem solve in eukaryotic replication ?

(d) State the role of ATP in controlling sliding DNA clamp loading.

3. Answer any *one* question of the following : 8×1

(a) The *mmm* operon which has sequence A,B,C and D encodes enzyme 1 and 2. Mutations in A,B,C,D have the following effects where

+ = synthesis

- = no synthesis

Mutation in sequence	mmm absent		mmm present	
	Enzyme1	Enzyme2	Enzyme1	Enzyme2
A	-	+	-	-
B	+	+	+	+
C	+	+	-	-
D	-	-	-	-

Is *mmm* operon inducible or repressible? Indicate which sequence (A,B,C or D) is part of the following components of the operon:

Regulator gene —

Promoter —

Structural gene for enzyme 1 —

Structural gene for enzyme 2 —

- (b) How do two DNA polymerases remain linked at the replication fork while synthesizing DNA on both the leading and lagging template strands? Explain with the help of a model.

(Group-B)

(Human Genetics)

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

- (a) What is cancer immunoediting ?
- (b) What is the candidate gene for the Muscular dystrophies? State the location of the gene and pattern of inheritance.
- (c) What is LINE and SINE ?
- (d) What are the clinical manifestations of β -thalassemia ?

5. Answer any *two* questions of the following : 4×2

- (a) Explain involvement of Tau Protein in the development of Alzheimer disease.

- (b) What is intravasation? Draw a labelled diagram of CFTR protein and state its clinical significance.
- (c) Name the chromosomes which have the highest and lowest gene density. What is human genome project? State its application.
- (d) State four Adhesion molecules involved in cancer cell metastasis and mention their functions.

6. Answer any *one* question of the following : 8×1

- (a) i) Illustrate the mechanism of β -Amyloid plaque formation from Amyloid precursor protein (APP) in Alzheimer's disease.
 - ii) How does disruption of basement membrane takes place in tumor metastasis.
 - (b) i) What is "Polyglutamine (Poly Q) Diseases"? Draw the relation between Polymorphic CAG repeat with Huntington disease.
 - ii) Explain co-integration model of transposon system.
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