

M.Sc. 2nd Semester Examination, 2013

ZOOLOGY

PAPER – ZOO-203

Full Marks : 40

Time : 2 hours

The figures in the right hand margin indicate marks

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

Illustrate the answers wherever necessary

**Write the answers to questions of each Group
in separate books**

GROUP – A

(Molecular Biology)

1. Answer any *two* of the following : 2×2

(a) Enumerate the function of RNAse H.

(Turn Over)

(2)

- (b) Mention the role of rut site in transcription termination in *E. Coli*.
- (c) How does a preinitiation complex form ?
- (d) Mention the sequences of ribosomal binding site within bacterial mRNA.
2. Answer any *two* of the following : 4 × 2
- (a) How does ribosome and *t*-RNA recycle in *E. Coli* ? Give proper diagram.
- (b) Describe briefly the specialized role of DNA pol δ , DNA pol ϵ and DNA pol α /primase in eukaryotic genome duplication.
- (c) Summarize sequentially the events of initiation of protein synthesis in bacteria with proper diagram.
- (d) What is attenuation ? Why presence of tryptophan leads to formation of termination hairpin structure.

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

(a) (i) Based on the analogy to a hand, mention the three domains of the DNA polymerase with their respective functions.

(ii) What is the function of sliding clamp loaders ?

(iii) Show the components of the DNA pol III holoenzyme with a neat diagram.

(b) A new sugar, sugarose, induces synthesis of two enzymes from the *sug* operon of *E. Coli*. Some properties of deletion mutations affecting the appearance of these enzymes are as follows (here + = enzyme induced normally, i.e. synthesized only in the presence of inducer ; C = enzyme synthesized constitutively ; 0 = enzyme can not be detected)

Mutation of	Enzyme 1	Enzyme 2
Gene A	+	0
Gene B	0	+
Gene C	0	0
Gene D	+	+

(i) The genes are adjacent, in the order $ABCD$. Which gene is most likely to be the structural gene for enzyme 1 ?

(ii)

Genotype	Enzyme 1	Enzyme 2
$A^+B^-C^+D^+/A^-B^+C^+D^+$	+	+
$A^+B^-C^+D^-/A^-B^+C^+D^-$	C	C
$A^-B^+C^-D^-/A^+B^-C^-D^-$	0	0

From all the evidence given, determine whether the following statements are true/false (explain).

- (I) It is possible that gene D is a structural gene for one of the two enzymes.
- (II) It is possible that gene D produces a repressor.

(5)

- (III) It is possible that gene *D* produces a cytoplasmic product required to induce gene *A* and *B*.
- (IV) It is possible that gene *C* produces a cytoplasmic product required to induce gene *A* and gene *B*.

GROUP – B

(Parasitology)

1. Answer any *two* questions from the following : 2 × 2
- (a) Define hyperparasite with suitable example.
- (b) What is glycocalyx ? Mention its function.
- (c) What are VAT and VSG ?
- (d) Distinguish between trophozoite and cyst of *Balantidium*.
2. Answer any *two* of the following : 4 × 2
- (a) What is Zoonosis ? Discuss briefly the pathogenecity of filariasis. 1 + 3

- (b) Enumerate the structure and composition of cestode tegument. 4
- (c) What do you mean by paratenic host? Discuss briefly with labelled diagram the first larval stage of *Schistosoma*. 1 + 3
- (d) Distinguish between hard tick and soft tick. What is papatasi fever? 3 + 1
3. Answer *one* question from the following : 8 × 1
- (a) Describe briefly about the life cycle of *Paragonimus Westermani*. Mention its pathogenesis and prophylaxis. 5 + 2 + 1
- (b) (i) "VSG protects African Trypanosomiasis from complement mediated lysis in the non-immune host" – Explain.
- (ii) What is the difference between relapses and reinfection? 6 + 2
-