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(May)

ZOOLOGY

(Major)

Course : 603

(Molecular Biology and Immunology)

Full Marks : 48

Pass Marks : 19

Time : 2 hours

*The figures in the margin indicate full marks
for the questions*

1. (a) Choose the correct answer : 1×5=5
- (i) In Z-DNA, one complete helix has 10/12/11/9-33 base pairs.
 - (ii) In prokaryotes, the enzyme responsible for synthesis of all kinds of RNAs is DNA polymerase/RNA polymerase/RNA polymerase I/RNA polymerase II.
 - (iii) The triplet codon which does not code for any amino acids is AUG/UAA/GAU/UUA.

- (iv) RNA-directed DNA polymerase is characteristic of all prokaryotes/retroviruses/lytic viruses/lysogenic viruses.
- (v) In an operon, RNA polymerase binds to operator gene/promoter gene/regulator/structural gene.
- (b) Write briefly about the following : $3+3=6$
- (i) Characteristics of genetic code
- (ii) Classes of transposable elements
2. Give an illustrated account of bacterial transformation with emphasis on Griffith's experiment. 7
3. Differentiate between any two of the following : $3 \times 2 = 6$
- (a) Leading strand and Lagging strand
- (b) Conjugation and Transduction
- (c) Pribnow box and TATA box
- (d) Superbug
4. Describe the structure and functions of different types of RNA. $5+3=8$
5. (a) Choose the correct answer : $1 \times 3 = 3$
- (i) B-cells are distinguished from T-cells by the presence of CD3/CD4/surface Ig/class IMHC antigen.

(ii) ELISA assays results in cell lysis/
uses a radiolabelled antibody/
involves addition of substrate which
is converted to a coloured end
product/requires sensitized RBC.

(iii) The receptor through with HIV
infects is CD2/CD3/CD4/CD5.

(b) Write short notes on any *two* of the
following : 3×2=6

(i) Application of monoclonal
antibodies

(ii) Radioimmunoassay (RIA)

(iii) Antigen-antibody reaction

6. Explain with suitable diagram the molecular
structure of a generalized immunoglobulin and
state the functions of its major classes. 5+2=7

Or

How humoral immunity differs from cell-
mediated immunity? Write the usefulness of
vaccination. 4+3=7
