

- (b) Describe any one method to study protein-protein interactions. (8)
4. (a) How does chromatin organization regulate gene expression? (7)
- (b) Describe the production of transgenic plants or animals with one example. (8)
5. (a) A virus integrates its DNA into the host genome using site-specific recombination.
- (i) Explain site-specific recombination.
- (ii) What role do enzymes like integrase play?
- (iii) Compare homologous vs site-specific recombination.
- (iv) How can viral integration affect host gene expression? (10)
- (b) Discuss why biosafety regulations are necessary for GMOs. (5)

(300)

[This question paper contains 4 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 7896 L

Unique Paper Code : 3183010021

Name of the Paper : Advance Molecular Biology
and Genetic Engineering
(DSE/GE)

Name of the Course : B.Sc. (H) Biomedical
Sciences (NEP-UGCF
2022)

Semester : VIII

Duration : 2 Hours Maximum Marks : 60

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **four** questions in all.
3. Question No. 1 is compulsory.
4. Give illustrations and examples wherever required
5. Subparts of the questions should be attempted together.

P.T.O.

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1. (a) Briefly explain the following : (Any 5) (5×1=5)

(i) Genetic code degeneracy

(ii) Reverse transcriptase

(iii) Point mutation

(iv) Transgenics

(v) Operon

(vi) CAS9

(b) Justify the following statements as true or false :
(Any 5) (5×2=10)

(i) DNA exists only in the double helix (duplex) form in living cells.

(ii) Nucleosomes are formed by DNA wrapping around histone proteins.

(iii) A gene cloned into a vector will always be expressed in the host cell.

(iv) Genetic engineering has no ethical or legal concerns.

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(v) Fusion proteins can help in purification of recombinant proteins.

(vi) Histidine tags are commonly used to purify fusion proteins.

2. (a) Differentiate between the following : (Any 3)
(3×4=12)

(i) Plasmid vectors Vs λ bacteriophage vectors

(ii) Prokaryotic Vs Eukaryotic Transposable Elements

(iii) Hoogsteen base pairing Vs Watson-Crick base pairing

(iv) Positive gene regulation Vs Negative gene regulation

(b) What are Type II restriction enzymes? (3)

3. (a) Explain how transposons contribute to antibiotic resistance. (7)

P.T.O.