

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- 2024
M.Sc.-II Semester (BT)

COURSE CODE(CREDITS):20MS1BT211(03)

MAX. MARKS: 15

COURSE NAME:Genetic Engineering

MAX. TIME: 1 Hour

COURSE INSTRUCTORS:Dr. Anil Kant

Note: (a) All questions are compulsory. (b) Marks are indicated against each question in square brackets. (c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

Q.1

- a. Enlist and elaborate on at least three general objectives of Genetic engineering?
- b. Justify one of following statements with appropriate examples i) Genetic Engineering is used to produce tools of genetic engineering ii) Production of genetically engineered therapeutics products/biologicals/proteins offers a unique opportunity for improvement displaying some clinical advantage over the native protein products.

[1.5x 2 =3]

Q.2 Write brief notes on any three of the applications / products of genetic engineering?

- a. Development of transgenic animals with at least three specific examples.
- b. Concept of Biopharming with three specific examples at least one from animal and plant as a production platform.
- c. Improvement of crop plants for nutritional quality with two specific examples.
- d. Concept of gene therapy with details of at least one latest gene therapy trial.

[2.0x 3 =6]

Q.3. Answer any two of the following questions in detail.

- a) What is the biological role of restriction enzymes? Correlate it with the phenomenon of restriction and modification which led to their discovery?
- b) Explain different types of restriction enzymes along with their key characteristics. Mention three key points, why type II enzymes are most useful in genetic engineering?
- c) What is the key characteristic of recognition sites of type II restriction enzymes? Write a full double stranded 6 bp restriction enzyme site with cutting and modification information of hypothetical restriction enzyme. First three bases of the first strand are 5'CTA___ and enzymes cleaves after first C from 5' end and its associated modification enzyme methylate at first A from 5' end.

- d) Discuss DNA ligases and mechanism of ligation. Why ligation reaction involving cohesive DNA fragments is carried out at 37 C, where as blunt end ligation is done at 24C

[3.0x 2 = 6]