

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

T3- EXAMINATION- MAY -2019

B.Tech 8th, Semester

COURSE CODE: 14I1WBT531

MAX. MARKS: 35

COURSE NAME: Plant Biotechnology

COURSE CREDITS: 03

MAX. TIME: 2 Hrs

Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.

Q.1 Attempt any five

10 CO I-V

- a. Most of the higher plants have about (i) ____ (no.) chloroplasts per leaf cell and each chloroplast contains approximately (ii) ____ (no.) copies of chloroplast genome. Majority of plant chloroplast genomes are (iii) ____ kbp in the size and contain about (iv) ____ (no.) genes
- b. Why additional rounds of plant regeneration on selective medium, are required in case of chloroplast transformation.
- c. DNA-binding domain of zinc finger nuclease consist of (i) ____ (nature), each of which consist of (ii) ____ (no.) amino acids and binds with (iii) ____ (no.) nucleotides in a DNA sequence.
- d. DNA-cleaving domain of TALEN and Zinc finger nuclease comprised of the nuclease domain of (i) ____ (name of enzyme), which is a Type II restriction enzyme derived from (ii) ____ (name of sp). It causes a (iii) ____ (type of damage) in target DNA which is repaired by (iv) ____ (type of repair system).
- e. DNA-binding domain of TALEN is taken from (i) ____ (nature of proteins) of (ii) ____ (name of genus organism) which consists of tandem repeats of monomers of (iii) ____ (no.) amino acid residues. Each such monomer binds with (iv) ____ (no.) nucleotides in a DNA sequence.
- f. What are advantages transgenic plants offers as living bioreactors over traditional expression systems

Q.2

2x3 = 6 CO III

- a. Avidin can be produced commercially in transgenic plants. Argue the case on basis of cost of production and regulatory concern aspects.
- b. Write short note on any one: Production of Aprotinin, in transgenic plants, Trypsin production via transgenic plants.

P.T.O.

Q.3

6 CO II CO V

Discuss following aspects of RNA interference; General mechanism ie How RNAi Works, Biological role, Advantage of RNAi as gene knockdown system, details of any one named mane applications of RNAi in plant Biotechnology

Q.4 Attempt any one

6 CO IV

- a. Chloroplast transformation of plants has a potential to solve some of the problems associated with plant genetic engineering. Justify the statement giving at least five such problems and how transplastomic plants can circumvent these.
- b. What are two delivery methods are currently available for introducing foreign DNA into plastids. Discuss procedure followed and design of chloroplast transformation vectors.

Q 5 Attempt any one

7 CO I CO II

- a. Discus following aspects of CRISPR-Cas System of genome editing: nomenclature and discovery, components, the three stages protection mechanism.
- b. Discuss CRISPR-cas as genome editing tool highlighting components to be delivered in the cells, general design of vectors, generalized method to perform genome editing, advantages over other genome editing systems