

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION- MAY -2018

B.Tech/ M.Tech 8th, 4th Semester

COURSE CODE: 14I1WBT531

MAX. MARKS:35

COURSE NAME: Plant Biotechnology

MAX. TIME: 2 Hrs

COURSE CREDITS: 03

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

Q.1 Fill in the blanks.

1x8=8 (10 minutes) (CO I, IV)

- a. pri-miRNA is cleaved pre-miRNA by _____ in plants and by _____ in animals.
- b. _____ is involved in transport of pre-miRNAs in animals while _____ its orthologue in plants translocate miRNA:miRNA duplex in plants
- c. Drought, salinity, heat and cold stress conditions ultimately result in _____ stress in plant cells.
- d. Some plant respond to osmotic stress by producing non toxic compounds called _____ to reduce osmotic potential.
- e. Each zinc finger consists of _____ amino acids and binds with _____ bp of DNA
- f. Monomers of TALE proteins consist of tandem repeats of _____ residues , two of which are located at positions _____ are highly variable called repeat variable di residue
- g. Cold responsive genes (COR) can be unregulated by expressing _____ transcription factor which binds at _____ in COR promoter
- h. Two general strategies advocated for protection from ROS are 1 _____ 2 _____

Q.2 Answer briefly.

1x4=4 (10 minutes) (CO I, III IV)

- A. What three types of damages caused to plant cells by water deficit stress?
- B. The basic strategy for engineering resistance to water deficit is production of osmo protectants in the plants. Name any three such osmo protectants.
- C. Why there is no possibility contamination of wild plants with transgene via transplastomic plants?
- D. Why there is possibility of very high level of protein expression in transplastomic plants compared to nuclear transgenic plants?

Q.3

3x3=9 (30 minutes) (CO I, II, IV)

- a. What advantages RNAi technology offer over gene disruptions knock down methods used to switch off target genes?
- b. In chloroplast modified plants why i) there is no effect of position of gene integration on level of expression ii) more than two transgenes gene clustered in form of operons
- c. What is role of following in CRISPR-Cas9 System i) Cas9 protein ii) trans activating crRNA iii) spacer and protospacer adjacent motif

Q.4

4 (20 minutes) (CO I, III, IV)

Elaborate on any two following application of RNAi in plant biotechnology. I) Blue coloured roses II) Non-browning Apple III) Healthier cottonseed oil or Better biofuels

Q.5

5 (20 minutes) (CO II, IV)

Discuss main components of vectors designed to deliver CRISPR Cas genome editing tool.

Q.6

5 (20 minutes) (CO IV)

Discuss any one recent research paper (Mention name of Authors years of publication) involving application of advanced techniques in the area of plant biotechnology? The discussion should focus around i) Problem solved/Concept validated i) Technique/methods used ii) Gene and gene construct involved iv) Gist of results obtained and conclusion.