

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST-3 EXAMINATION- JUNE -2016

B.Tech. BTDD, M.Tech.(Semester VIII, XI, II)

COURSE CODE: 1411WBT531

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

6x2=12

- a. Why metabolic engineering of fatty acids is getting importance?
- b. Why additional round of selection and regeneration are carried out in case of chloroplast transformation?
- c. Why chloroplast transformation is difficult? Give three specific reasons.
- d. Block and Stegemann 2009 reported that plastid DNA or plastids can migrate between cells in grafted plants. Mention at least two opportunities and limitations of extending chloroplast engineering to plants for which workable protocols are still lacking.
- e. What are industrial applications of castor oil, tung oil, erucic acid? What are production constraints of these oils/fatty acids?
- f. Mention the role Keto acyl ACP synthase and glycerol-3-phosphate acyl transferase (GPAT) in fatty acid or triacylglycerol biosynthetic pathways.

Q.2

3.5x2=7

- a. Chloroplast engineering can solve some problems of nuclear transformation. Justify the statement.
- b. What are the target enzymes for metabolic engineering of medium chain fatty acids? Why effort to enhance caprylic acid and capric acid content were not so successful in rapeseed in contrast to lauric acid?

Q3

Discuss any three examples of recent application of chloroplast engineering. What are limitations of plastid engineering? Suggest possible solution to overcome these. **4**

Q.4

Why lignin is considered as major hurdle in conversion of biomass into biofuel? Discuss any two biotechnological approaches being explored to reduce lignin content in energy crops. **4**

Q.5

Explain how transgene is targeted to plastid genome? Give general scheme of plastid transformation vectors and plastid repeat vectors. Specify the role and source of following in plastid expression cassette; a) plastid promoter, b) 5' UTR, c) 3' UTR

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