

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -3 EXAMINATION- May 2017

B.Tech XI /M.Tech II Semester

COURSE CODE: 14M11BT215

MAX. MARKS:35

COURSE NAME: Metabolic engineering

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.

- Q1 a) Differentiate between lignin and lignin. (1 Mark)
- b) Define the functions of Flavonoids. (2 Mark)
- c) Why Acetyl COA is considered as a versatile metabolite? (2 Mark)
- Q2) Describe the biosynthesis of following alkaloids: (4 Marks)
- a) Ajmalicine, b) Catharanthine c) Vinblastine d) Vincristine
- Q3) Differentiate between primary and secondary metabolism? Explain the link between primary and secondary metabolic pathways with special context to sesquiterpene? (4 Marks)
- Q4) Explain the classification and biosynthetic pathway of terpene formation. (4 Marks)
- Q5) How shikimate pathway proceeds in plants? Illustrate the biosynthetic routes towards tryptophan, tyrosine and phenylalanine production with the help of schematic representation. Briefly propose a metabolic engineering strategy to increase the production of phenylalanine in plants? (4 Marks)
- Q6) What do you understand by "stable isotopes"? Why stable isotopes are preferable over their other isotopes in elucidation a metabolic pathway? (4 marks)
- Q7) What is metabolic flux? Explain a methodology by which Intracellular metabolic fluxes can be analyzed. (5 marks)
- Q8) Define the role of ^{13}C Carbon in metabolic flux analysis (MFA) and also describe the application of this model-based tool. Name two analytical methods utilized for detection and quantification of ^{13}C -labeled molecule in a metabolic pathway analysis. (5 marks)