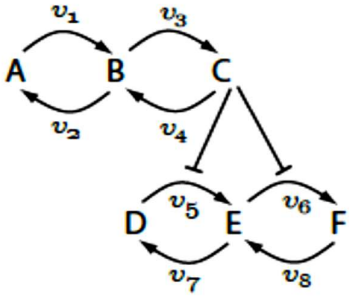
BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION)

CLASS: : B.TECH **SEMESTER : VII**
BRANCH: BIOTECHNOLOGY **SESSION : MO/2025**

SUBJECT: BE313 METABOLIC ENGINEERING

TIME: 02 HOURS **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	With a neat flow chart, explain the steps involved in the biosynthesis of secondary metabolites?	[5]	1	Understanding
Q.2(a)	(i) Discuss about the regulation of metabolic pathways. (ii) Write in detail about the fundamental requirements for metabolic engineering?	[5]	1	Applying
Q.3(a)	Consider a linear chain of reactants from S1 to S5. (i) Write out the mass-balance equations for this simple system. (ii) Write out the stoichiometry matrix for the simple chain of reaction system $S_1 \xrightarrow{v_1} S_2 \xrightarrow{v_2} S_3 \xrightarrow{v_3} S_4 \xrightarrow{v_4} S_5$	[5]	2	Evaluating
Q.4(a)	Write about isotopic flux measurement and its application's in metabolic engineering?	[5]	2	Applying
Q.5(a)	The figure illustrates a simple protein signalling network, comprising two double phosphorylation cycles coupled by inhibition by protein C on the lower double cycle (D,E and F) . Write the stoichiometric matrix for the system? 	[5]	2	Applying

:::::22/09/2025 :::::M