JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY WAKNAGHAT

TEST -3 EXAMINATION-2026

B Tech BT -4th Sem (BT)

COURSE CODE(CREDITS): 18B11BT411 (4) MAX. MARKS: 35

COURSE NAME: Cell Biology and Culture Technologies

COURSE INSTRUCTORS: Dr Hemant Sood &Dr Udaybanu M MAX. TIME: 2hrs

Note: a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems

	Question	CO	Marks
Q1	A)Compare Agrobacterium-mediated transformation and biolistic (gene gun) method in terms of efficiency, cost, and applicability. Under what conditions would you prefer one over the other? B) Why is Agrobacterium tumefaciens considered a "natural genetic engineer"? Critically analyze the mechanism of T-DNA transfer.	CO3	3.5 +3.5
Q2	A) How can somatic hybridization be used to transfer disease resistance from wild species of Rose to cultivated crops of Potatoes? Explain with a logical approach. B) After fusion, many non-fused parental cells are still growing. What strategy would you apply to eliminate them?	CO4	(3.5+2.5)
Q3	A) How can plant tissue culture techniques enhance the production of secondary metabolites? Cite with examples	CO2	3.0
Q4	In anther culture, only callus is formed but no haploid plants are regenerated. Analyze possible causes. How can haploid plants be used to develop completely homozygous lines?	CO5	1.5+1.5
Q4	A) In an experiment, cells are exposed to an industrial dye for 2 hours. Calculate the percentage of cell death using tryphan blue staining protocol. The number of stained cells is 20, and the number of unstained cells is 80. Explain the principle behind the assay. B)Devise a protocol to determine preliminary and confirmatory apoptotic pathway analysis. Explain the molecular and biochemical features of apoptosis.	CO6	(4.5 +5.5)
Q5	Explain the importance of the following components used in a cell culture media: (a) Inorganic salts (b) Phenol red (c) Bicarbonate buffer	CO1	(2*3 = 6)