Register Number:……..

KUMARAGURU
college of technology
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B.E/B.TECH DEGREE EXAMINATIONS: NOV/DEC 2024

(Regulation 2018)

Sixth Semester

BIOTECHNOLOGY

U18BTT6002**:** Cell Culture Techniques

COURSE OUTCOMES

CO1: Outline and design model laboratory layout for setting up a plant tissue culture and animal cell culture lab.
CO2: Compare and illustrate plant and mammalian cell culture techniques and media for culturing of plant and mammalian cells
CO3: Elaborate and compare various plant tissue culture technique
CO4: Significant applications of tissue culture techniques in generating transgenic plants
CO5: Explain and illustrate techniques for development of primary and established cell culture and measurement of cell viability.
CO6: Illustrate the plant and mammalian cell techniques for economic importance

Time: Three Hours **Maximum Marks: 100**

Answer all the Questions:-
PART A (10 x 2 = 20 Marks)
(Answer not more than 40 words)

1.	Classify various biosafety level (BSL) based on risk groups involved	CO1	[K_2]
2.	Specify the main function of any classes of Biosafety cabinet (BSC)	CO1	[K_3]
3.	List any two issues associated with culture media for culturing the cell lines	CO2	[K_2]
4.	Abbreviate: tPA and DMSO	CO2	[K_2]
5.	Mention the function of maerozyme in single cell isolation	CO3	[K_2]
6.	Distinguish the chemostat with turbidostat	CO3	[K_2]
7.	Define Cell strains	CO4	[K_3]
8.	Suggest any two assays to detect the dead cells in the culture flask	CO4	[K_2]
9.	Recommend two viral vectors for gene transfer in plants	CO5	[K_2]
10.	What is Transfection technology?	CO6	[K_2]

Answer any FIVE Questions:-
PART B (5 x 16 = 80 Marks)
(Answer not more than 400 words)

11.	a)	Recommend the various biosafety levels to handle risk groups (1 to 4), and their practices and facilities required to overcome the different contamination.	10	CO1	[K_3]

	b)	Suggest the standard operating procedures to handle BSL 2 agents using Class II Biosafety cabinet	6	CO1	[K_3]
12.	a)	Why it is important to characterize newly established cell line under invitro conditions? Recommend few characterization techniques to check the purity and stability of cell line.	10	CO2	[K_3]
	b)	What is the necessity of using serum and serum free media for culturing of mammalian cells? Justify your answer.	6	CO2	[K_2]
13.	a)	Describe few plant tissue culture techniques to develop haploid plants with neat diagrams.	10	CO3	[K_3]
	b)	Highlight the importance of somatic hybridization technique.	6	CO3	[K_2]
14.	a)	Give your insights and experimental procedure to perform dye exclusion assay for the HeLa Cell line	10	CO4	[K_3]
	b)	During your summer internship programme, your research supervisor asked to passage 100 ml of Vero cell line (P number 5) by 1:2 split ratio when it reaches 88% confluency. The entire 100 ml may aliquot into 10 ml by using T-25 flask under aseptic condition. Suggest suitable techniques to maintain the vero cell line for the P number 6 and how many T-25 flask needed for culture of vero cell line?	6	CO4	[K_4]
15.	a)	Due to weeds in the soybean cultivation, estimated yield loss goes upto 12%. To overcome the yield loss, suggest the Roundup resistant soybean and enlighten the environmental impacts	10	CO5	[K_2]
	b)	Draw the structure of tumor inducing plasmid and label vir genes.	6	CO5	[K_2]
16.	a)	Explain the production process of a vaccine of your own interest using transgenic animals.	10	CO6	[K_3]
	b)	Success rate is very less for the Micropropagation of economical in important plants. Justify the reason.	6	CO6	[K_4]

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