Reg. No. : | | | | | | | | | | | | |

Question Paper Code: UC301

B.E./B.Tech. DEGREE EXAMINATION, NOV 2024

Professional Elective

Biotechnology

21BTV301-CANCER BIOLOGY

(Regulations 2021)

Duration: Three hours | Maximum: 100 Marks

Answer All Questions

PART A - (10 x 2 = 20 Marks)

1.	Suggest the different modes of cancer treatment.	CO1-U
2.	Define cancer and provide examples of different types.	CO1-U
3.	Define Carcinogenesis.	CO1-U
4.	Indicate the mechanisms by which radio-therapeutic agents inhibit cancer cells.	CO1-U
5.	Given a scenario where a cancer cell has defective DNA repair mechanisms, how might this contribute to drug resistance in chemotherapy?	CO2-App
6.	What is the role of retroviruses in the identification of oncogenes?	CO1-U
7.	How does the tumor microenvironment influence the metastatic potential of cancer cells?	CO1-U
8.	If a cancer patient's tumor biopsy reveals significant basement membrane disruption, how might this affect the likelihood of metastasis, and what therapeutic strategies could be employed to target this process?	CO3-App
9.	Describe one modern technique used for early detection of cancer.	CO1-U
10.	How does personalized medicine improve cancer therapy outcomes?	CO1-U

PART – B (5 x 16= 80 Marks)

11.	(a)	Explain the role of cell cycle checkpoints in regulating normal cell division and how their dysregulation contributes to cancer development.	CO1-U	(16)

Or

	(b)	Explain in detail about the classification of cancer based on tissue types	CO1-U	(16)
12.	(a)	Carcinogenesis is the complex, multi-step process by which normal cells undergo genetic and epigenetic alterations, leading to uncontrolled cell division and tumor formation, ultimately resulting in cancer. Outline the process in detail.	CO2-App	(16)
		Or		
	(b)	Compare and contrast the mechanisms of chemical carcinogenesis and physical carcinogenesis. How do the processes of initiating cancer differ between these two types of carcinogens?	CO2-App	(16)
13.	(a)	Predict how the detection of specific oncogenes can guide personalized cancer treatment. Discuss the relevance of genetic profiling in developing targeted therapies.	CO2-App	(16)
		Or		
	(b)	Compute the role of DNA repair pathways in maintaining genomic stability and preventing cancer. How do defects in these pathways influence the effectiveness of cancer treatments?	CO2-App	(16)
14.	(a)	Explain the stages of the metastatic cascade. How do each of these stages contribute to the spread of cancer cells from the primary tumor to distant sites?	CO1-U	(16)
		Or		
	(b)	Discuss the mechanism of tumor invasion in cancer progression.	CO1-U	(16)
15.	(a)	What are the different modalities of cancer therapy? Discuss the primary forms of treatment and their distinct roles in addressing cancer.	CO1-U	(16)
		Or		
	(b)	How do gene therapy methods work in the context of cancer therapy?	CO1-U	(16)