U.S.N.										

B.M.S. College of Engineering, Bengaluru-560019

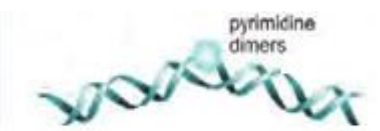
Autonomous Institute Affiliated to VTU

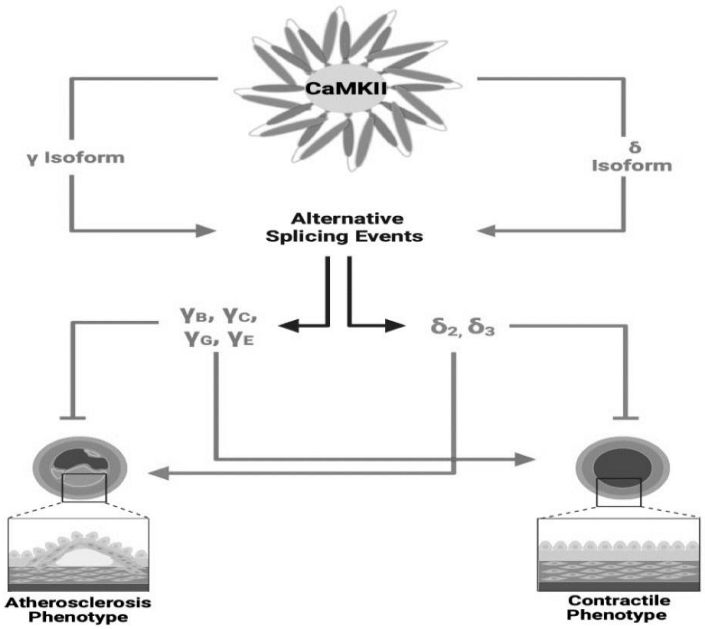
September / October 2023 Semester End Main Examinations

Programme: B.E. **Semester: IV**
Branch: Biotechnology **Duration: 3 hrs.**
Course Code: 22BT4PCCMB **Max Marks: 100**
Course: CELL AND MOLECULAR BIOLOGY

Instructions: 1. Answer any FIVE full questions, choosing one full question from each unit.
2. Missing data, if any, may be suitably assumed.

Important Note: Completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages. Revealing of identification, appeal to evaluator will be treated as malpractice.

			UNIT - I	*CO*	*PO*	Marks
1	a)		Discuss how the Nucleolus plays crucial role on initiation of translation process in Eukaryotes.	*CO 1*	-	**6**
	b)		Differentiate between Rolling circle and theta model of replication in Prokaryotes.	*CO 2*	*PO 1*	**6**
	c)		How does replication of DNA regulated in Eukaryotes. With specific mechanism, discuss the consequences of de-regulation of the process leading to Cancer.	*CO 4*	*PO 6*	**8**
			OR			
2	a)		Human DNA is 5 feet long and still accommodated in 10 um organelle. Justify the statement with reference to the process and components involved.	*CO 1*	-	**6**
	b)		Progressive shortening of telomeres leads to senescence, apoptosis, or oncogenic transformation of somatic cells, affecting the health and lifespan of an individual. Better choice of diet and activities has great potential to reduce the rate of telomere shortening or at least prevent excessive telomere attrition, leading to delayed onset of age-associated diseases and increased lifespan. Apply the concepts of DNA replication to comment on the statement.	*CO 4*	*PO 6*	**8**
	c)		Distinguish between various categories of cytoskeletal elements on the basis of structures.	*CO 1*	-	**6**
			UNIT - II			
3	a)		List various types of mutations and discuss any four types of mutation with suitable examples.	*CO 4*	*PO 6*	**8**
	b)		A  B 	*CO 3*	*PO 1*	**6**

			The image above depicts two major categories of repair systems which can correct the damaged DNA. What are those repair system. Detail the steps involved in repairing the DNA.			
		c)	With suitable figure of holiday junction, write the products formed from the resolution of the junction.	*CO 3*	*PO 1*	**6**
			UNIT - III			
	4	a)	Initiation of transcription of coding RNA in eukaryotes is complicated process. Discuss the process with suitable justification to the statement.	*CO 2*	*PO 1*	**8**
		b)	Capping mechanism is important in m RNA that protects it from nuclease actions. Validate the statement with the detailed process of capping.	*CO 2*	*PO 1*	**6**
		c)	There are several antibiotics available in markets that act as inhibitors of transcription in bacterial infection. Discuss any two with their mechanism of inhibition.	*CO 4*	*PO 6*	**6**
			OR			
	5	a)	Spliceosome are RNA splicing machinery involved in removal of introns. Apply the knowledge of splicing in the following image and discuss the mechanism as well as the consequences. 	*CO 2*	*PO 1*	**8**
		b)	Write the various subunits of RNA Pol of bacteria , their interaction with promoters and role of sigma factor in sensing the variations in temperature .	*CO 2*	*PO 1*	**6**
		c)	Add a note on any two types of Non coding RNA.	*CO 2*	*PO 1*	**6**
			UNIT - IV			
	6	a)	Differentiate between Translation initiation process in Prokaryotic and Eukaryotic organism.	*CO 2*	*PO 1*	**8**
		b)	List any four Post translation modification that occur in proteins. Discuss briefly any 2 types of PTM.	*CO 2*	*PO 1*	**6**

		c)	Misfolded proteins needs to undergo proteosomal degradation in order to save the cell from getting into a diseased conditions. Justify the statement with the steps and machinery involved in proteosome meditated protein degradation.	*CO 4*	*PO 6*	**6**
			UNIT - V			
	7	a)	Discuss the regulation of lactose metabolism in the absence and presence of glucose in *E. coli.*	*CO 2*	*PO 1*	**8**
		b)	Leader peptide synthesis is one of the marker for the trp operon regulation. Discuss.	*CO 2*	*PO 1*	**6**
		c)	With any one suitable example deliberate gene regulation in Eukaryotes.	*CO 2*	*PO 1*	**6**

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