

**LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034****B.Sc. DEGREE EXAMINATION – ADVANCED ZOOLOGY AND BIOTECHNOLOGY****FIFTH SEMESTER – NOVEMBER 2023****UAZ 5501 – MOLECULAR BIOLOGY**

Date: 30-10-2023

Dept. No. 

Max. : 100 Marks

Time: 09:00 AM - 12:00 NOON

**SECTION A - K1 (CO1)****Answer ALL the Questions****(10 x 1 = 10)****1. Definitions)**

a) Telomere

b) Codon

c) Intron

d) Repressor

e) SiRNA

**2. Fill in the blanks**

a) Short stretches of DNA that bind with particular DNA sequence are \_\_\_\_\_

b) Nuclear ribosomes are otherwise known as \_\_\_\_\_

c) The process of formation of new genes is called \_\_\_\_\_

d) Enhancers are \_\_\_\_\_ sequences that increase the transcription of genes

e) \_\_\_\_\_ is a molecular lesion formed in DNA by exposure to sunlight

**SECTION A - K2 (CO1)****Answer ALL the Questions  
10)****(10 x 1 =****3. Match the following**

a) Semiconservative replication - mRNA

b) Transcription - RNA complex

c) Exon - Gene expression

d) Gene silencing - DNA

e) Spliceosome - Coding region

**4. True or False**

a) DNA is deoxyribonucleic acid

b) AUG is the initiation codon in eukaryotes

c) Protein phosphorylation is not a post-transcriptional modification

d) Regulation of transcription in eukaryotes is very simple

e) miRNAs are regulator RNAs that block transcriptions

**SECTION B - K3 (CO2)****Answer any TWO of the following****(2 x 10 = 20)**5. (i) Describe the salient features of DNA and RNA (5)  
(ii) Explain the synthesis of mRNA (5)

6. Explain the splicing mechanism in eukaryotes

7. Describe *lac* operon and *trp* operon in prokaryotes

8.	Describe mismatch repair in DNA repair mechanism	
<b>SECTION C – K4 (CO3)</b>		
<b>Answer any TWO of the following</b>		<b>(2 x 10 = 20)</b>
9.	Illustrate the Watson and Crick Model of DNA and types of DNA	
10.	(i) List out the types of RNAS	(5)
	(ii) Illustrate the structure of globin mRNA	(5)
11.	Illustrate transcription regulation in prokaryotes	
12.	(i) Illustrate gene imprinting dimerization	(5)
	(ii) Illustrate riboswitches	(5)
<b>SECTION D – K5 (CO4)</b>		
<b>Answer any ONE of the following</b>		<b>(1 x 20 = 20)</b>
13.	i) Summarise replication telomeres	(5)
	(ii) Interpret the structure of RNA	(10)
	(iii) Evaluate RNA editing	(5)
14.	i) Elaborate (i) Transcription regulation in eukaryotes	(10)
	(ii) siRNA and miRNA	(10)
<b>SECTION E – K6 (CO5)</b>		
<b>Answer any ONE of the following</b>		<b>(1 x 20 = 20)</b>
15.	(i) Compile replication of DNA	(10)
	(ii) Differentiate prokaryotic translation from eukaryotic translation	(10)
16.	(i) Discuss splicing mechanism	(5)
	(ii) Summarise gene silencing and genetic imprinting	(5)
	(iii) Elaborate DNA repair mechanism	(10)

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