



EXAMINATIONS
Institute of Indigenous Medicine
13 FEB 2020
University of Colombo

INSTITUTE OF INDIGENOUS MEDICINE, UNIVERSITY OF COLOMBO
DEGREE OF BACHELOR OF AYURVEDA MEDICINE AND SURGERY
LEVEL II – FIRST SEMESTER EXAMINATION – JANUARY- FEBRUARY 2020

AS 2107 – PRINCIPLES OF GENETICS, MOLECULAR BIOLOGY AND
BIO TECHNOLOGY

Date: 13.02.2020

Time: 9.45 a.m – 11.15 a.m

Index No

Answer all questions.

Part I - Structured Questions

I.

- 1.1 List four (04) differences in the process of Transcription as opposed to DNA Replication. (04 Marks)

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- 1.2 Write two (02) statements to justify the importance of regulating the expression of a gene. (02 Marks)

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1.3 Human Genetic code is a degenerative code. List two (02) significances of this. (04 Marks)

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1.4 Human genes can undergo point mutations. List two (02) types of such mutations with two (02) disease conditions for each. (10 Marks)

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2.

2.1 List five (05) infectious diseases which can be accurately diagnosed by Polymerase Chain reaction (PCR) based tests. (05 Marks)

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2.2 What is a "Restriction enzyme". briefly explain. (05 Marks)

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2.3 List two (02) applications of traditional Biotechnology in medicine. (04 Marks)

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2.4 List three (03) applications of Gene based therapeutics in medicine. (06 Marks)

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Part II – Essay Questions

1. Golden Rice is a genetically modified (GM) plant which is being extensively used by Indians. Discuss the benefits and concerns about using GM crop plants by humans. (20 Marks)

2.

2.1 Write a short essay on Gene therapy and its use medical therapeutics. (10 Marks)

2.2 The following is the nucleotide sequence of a coding DNA strand of a human gene.

5' AATGCCATATTACCCTAAC 3'

a. Write the nucleotide sequence of the transcribed RNA strand (2.5 Marks)

b. Write the possible reading frames of the transcribed RNA strand and the corresponding amino acid sequence of each reading frame using the genetic code provided [Figure: 1]. (06 Marks)

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- c. Select the amino acid sequence of the biologically significant protein which will be produced at the end of the gene expression. Explain the reasons for your selection. (1.5 Marks)

		Second Letter								
		U		C		A		G		
1st letter	U	UUU UUC UUA UUG	Phe Leu	UCU UCC UCA UCG	Ser	UAU UAC UAA UAG	Tyr Stop Stop	UGU UGC UGA UGG	Cys Stop Trp	U C A G
	C	CUU CUC CUA CUG	Leu	CCU CCC CCA CCG	Pro	CAU CAC CAU CAG	His Gln	CGU CGC CGA CGG	Arg	U C A G
	A	AUU AUC AUA AUG	Ile	ACU ACC ACA ACG	Thr	AAU AAC AAA AAG	Asn Lys	AGU AGC AGA AGG	Ser Arg	U C A G
	G	GUU GUC GUA GUG	Val	GCU GCC GCA GCG	Ala	GAU GAC GAA GAG	Asp Glu	GGU GGC GGA GGG	Gly	U C A G

Figure: 1 Genetic code
