



ACADEMIC YEAR 2022-23 – ODD SEMESTER

Continuous Learning Assessment Test I

Reg. No.	R	A													
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Course Code: 21BTB102T	Course Title: Introduction to Computational Biology													
Sem & Year: I / I	Date: 21/10/2022				Duration: 100 Minutes				Max. Marks: 50					

	Course Outcomes (COs)	Program Outcomes (POs)												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
CO-1	Correlate cell growth, reproduction, and differentiation				1											
CO-2	Categorize the concepts and principles of biochemistry and relate their application in genomics	2			2											

Part A (Answer all)

10 x 1 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
1	Diploid cell has _____ chromosomes (a)23 (b)24 (c)46 (d)92	1	1	L1		4
2	Always the new generation will have better fitness score than the older one (a)true (b>false	1	1	L1		4
3	<u>metaphase</u> phase has chromosomes in the centre of the cell	1	1	L1		4
4	Inner cell mass is obtained from _____ (a) blastocyst (b) morula (c) gastrula (d) zygote	1	1	L1		4
5	Homologous pair of chromosome for X is (a)Y (b)23 (c) XY (d) 1	1	1	L2		4
6	GenBank is a (a)primary (b) secondary (c)tertiary (d)composite database	1	2	L1		1,4
7	The Rough draft of human genome was published through (a)HGP (b)HHF (c)HMM (d)HRP	1	2	L1		1,4
8	The blueprint for the construction of a protein is (a) tRNA (b) gRNA (c)mRNA (d) cDNA	1	2	L1		1,4
9	A molecule containing sugar, phosphate and a base is called (a) nucleoside (b) Nucleotide (c)aminoacid (d) carbohydrate	1	2	L1		1,4
10	Production of glucagon is because of (a)hyperglycemia (b) Hyperkalemia (c) Hypokalemia (d) hypoglycemia	1	2	L2		1,4

Part B (Answer any 3)

3 x 10 Marks = 30 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
11	Give a note on genetic algorithms (unit 1- no. 62 onwards)	10	1	L2		4
12	Write a detailed note on carbohydrates with illustrated examples (unit 2- no. 16-22)	10	2	L1		1,4
13	Explain the characteristics of a eukaryotic cell (unit 1- no. 11-31)	10	1	L1		4
14	Write about genomics with a special note on comparative genomics (unit 2- no 51-55)	10	2	L2		1,4

PART C (Answer the Following)

1 x 10 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
15 a	How did the eukaryotic cell develop organelles -which was missing in prokaryotes- which were the first organisms on earth? (the endosymbiotic theory)	10	1	L4		4
15 b	Give the ethical and legal issues of using stem cell. (Ethical issues specific to human cloning include: the safety and efficacy of the procedure, cloning for destructive embryonic stem cell research, the effects of reproductive cloning on the child/parent relationship, and the commodification of human life as a research product.)					



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B. Tech. Biotechnology Program



SRM
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(Deemed to be University u/s 3 of UGC Act, 1956)

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CO-1	Correlate cell growth, reproduction, and differentiation				1											
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Part A (Answer all)

10 x1 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
1	Haploid cell has _____ chromosomes (a)23 (b)24 (c)46 (d)92	1	1	L1		4
2	The transfer of genetic material through viruses is called (a) translation (b) transduction (c) conjugation (d) transformation	1	1	L1		4
3	Cyclins regulate the _____ cell cycle _____	1	1	L1		4
4	Afferent pathway is (a) brain to motor neurons (b) heart to brain (c) sensory neuron to brain (d) lungs to brain	1	1	L1		4
5	Sister chromatids are joined by (a) centromere (b) centrosome (c)centriole (d)telomere	1	1	L2		4
6	Cholesterol is a (a) steroid (b)hormone (c) enzyme (d)synthetic compound	1	2	L1		1,4
7	What is the bond between carbohydrates (a)alkyl (b) glycosidic (c)peptide (d)phosphate	1	2	L1		1,4
8	The mechanism of delivering aminoacids for translation is done by (a) tRNA (b) gRNA (c)mRNA (d) rDNA	1	2	L1		1,4
9	DNA is different from RNA because of the base (a) cytosine (b) guanine (c) uracil (d) adenine	1	2	L1		1,4
10	The algorithm compares a protein query sequence against a nucleotide sequence database dynamically translated in all reading frames. (a)BLASTn (b) BLASTp (c) tBLASTn (d) BLASTx	1	2	L2		1,4

Part B (Answer any 3)

3 x 10 Marks = 30 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
11	Illustrate and explain meiosis unit 1(no- 49-52)	10	1	L2		4
12	Write a detailed note on proteins with illustrated examples (unit 2- slide no 29-38)	10	2	L1		1,4
13	Explain the characteristics and uses of stem cells unit 1(no- 54-61)	10	1	L1		4
14	Write about BLAST algorithm and its types ((unit 2- slide no 60 inwards)	10	2	L2		1,4

PART C (Answer the Following)

1 x 10 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
15 a	Human genome project – found the complete sequence of 46 chromosomes.- using this information what can be done. (Personalised medicines, new drug targets, prediction of risks to diseases, familial disease identification, And many more)	10	2	L4		1,4
15 b	Justify why structure of a protein determines the function of the protein. (Protein function is based on structure. Shape of a protein determines function like hormones, enzymes will be globular, and will do various metabolic functions while fibrous like keratin hold the cell structure)					



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Part A (Answer all)

10 x 1 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
1	Meiosis produces (a) Haploid (b) Diploid (c) multiploidy (d) uniploid cells	1	1	L1		4
2	The genetic algorithm is inspired by (a) nature (b) nervous system (c) evolution (d) immunosystem	1	1	L1		4
3	<u>Pluripotent</u> cell can form into any type of cell except placenta	1	1	L1		4
4	Efferent pathway is (a) brain to motor neurons (b) heart to brain (c) sensory neuron to brain (d) lungs to brain	1	1	L1		4
5	Sister chromatids are separated in mitosis at (a) prophase (b) anaphase (c) metaphase (d) interphase	1	1	L2		4
6	Starch is a (a) polysaccharide (b) monosaccharide (c) lipid (d) wax	1	2	L1		1,4
7	What is the bond between nucleotides (a) alkyl (b) glycosidic (c) peptide (d) phosphodiester	1	2	L1		1,4
8	The RNA attached to ribosomes are (a) tRNA (b) gRNA (c) mRNA (d) rRNA	1	2	L1		1,4
9	"DNA is different from RNA because of" - Find the odd one (a) single stranded (b) 5' oxygen (c) uracil (d) more stable	1	2	L1		1,4
10	----- compares a protein query sequence against a protein sequence database dynamically translated in all reading frames. (a) BLASTn (b) BLASTp (c) tBLASTn (d) BLASTx	1	2	L2		1,4

Part B (Answer any 3)

3 x 10 Marks = 30 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
11	Illustrate and explain homeostasis (unit 1- 33-37)	10	1	L2		4
12	Write a detailed note on restriction digestion (unit 2- slide number 32- 35)	10	2	L1		1,4
13	Explain the characteristics of cell cycle and its control (unit 1 39-41)	10	1	L1		4
14	Explain genomics and its types (unit 2- slide number 51-55)	10	2	L2		1,4

PART C (Answer the Following)

1 x 10 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
15 a	Explain how invitro fertilization is related to stem cell- (embryonic stem cells)	10	1	L4		4
15 b	Mesoderm forms the circulatory system- what is the parts and function of circulatory system (heart ,vascular system of arteries and veins, lungs etc)					



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Part A (Answer all)

10 x 1 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
1	Mitosis produces gametes (a) True (b) False	1	1	L2		4
2	The organism that is unicellular but eukaryotic is (a) plant (b) animalia (c) protist (d) Monera	1	1	L1		4
3	<u>Fitness</u> score is used to find the best solutions in genetic algorithm	1	1	L1		4
4	Which is the control system involved in homeostasis (a) CNS (b) kidney (c) heart (d) stomach	1	1	L1		4
5	Meiosis I leads to separation of (a) two nucleus (b) sister chromatids (c) two cells (d) homologous chromosomes	1	1	L1		4
6	Estrogen is a (a) steroid (b) biomolecule (c) enzyme (d) protein	1	2	L1		1,4
7	Choose the disaccharide (a) Sucrose (b) ribose (c) fructose (d) glucose	1	2	L1		1,4
8	Choose the odd one out (a) tRNA (b) gRNA (c) mRNA (d) rRNA	1	2	L1		1,4
9	UNIPROTKB is a Sequence database for (a) nucleic acids (b) proteins (c) DNA (d) lipids	1	2	L1		1,4
10	Two similar protein sequences indicate (a) Similar function (b) Different function (c) both (d) no meaning	1	2	L2		1,4

Part B (Answer any 3)

3 x 10 Marks = 30 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
11	Illustrate and explain mitosis (Unit 1- slide no 44-47)	10	1	L2		4
12	Write a detailed note on lipids and its different types and uses (Unit 2- slide no 23-28)	10	2	L1		1,4
13	List a detailed role of cell organelles in eukaryotic cell (Unit 1- slide no 12-31)	10	1	L1		4
14	Write about the macromolecule nucleic acids (Unit 1- slide no 39-45)	10	2	L2		1,4

PART C (Answer the Following)

1 x 10 Marks = 10 Marks

Q. No.	Questions	Marks	CO	BL	Marks Scored	PO(s)
15 a	Diabetes disease – what is the role of carbohydrates in this disease – (Blood sugar should be 120mg/dL- anything higher is diabetes- caused by insulin resistance due to which cells receive less sugar and hence metabolism and cellular functions are disrupted)	10	2	L4		1,4
15 b	Iterate how genomics can be used to make personalized medicines – (genomics means whole genome of a patient is known. Hence by looking at the genomic information- medicines that will cause less sideeffects to the patient can be prescribed)					