



Manipal Institute of Technology, Manipal

(A Constituent Institute of Manipal University)



III SEMESTER B.TECH (BIOTECHNOLOGY) MAKEUP EXAMINATIONS, DEC 2015/JAN 2016

SUBJECT: CELL AND MOLECULAR BIOLOGY [BIO 2101]

REVISED CREDIT SYSTEM

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

✤ Answer ALL the questions.

✤ Missing data may be suitable assumed.

1A.	Would you expect to see more or less acetylation in regions of DNA that are sensitive to digestion by DNase I? Why?	4M
1B.	A plant breeder wants to isolate mutants in tomatoes that are defective in DNA repair. However, this breeder does not have the expertise or equipment to study enzymes in DNA repair systems. How could the breeder identify tomato plants that are deficient in DNA repair? What are the traits to look for?	3М
1C.	The carbohydrates attached to some proteins and lipids of the plasma membrane are added as the membrane is made and refined in the ER and Golgi apparatus. The new membrane then forms transport vesicles that travel to the cell surface. On which side of the vesicle membrane are the carbohydrates?	3М
2A.	In the 1920s, while working with <i>Streptococcus pneumonia</i> (the agent that causes pneumonia), Griffith injected mice with different types bacteria. For each of the following bacteria types injected, state with reason whether the mice lived or died: a) type IIR b) type IIIS c) heat-killed IIIS d) type IIR + heat-killed IIIS	4M
2B.	How can a target cell's response to a hormone be amplified more than a millionfold? Explain with an example.	3M
2C.	The results of several studies provide evidence that DNA repair is rapid in genes that are undergoing transcription and that some proteins that play a role in transcription also participate in DNA repair. How are transcription and DNA repair related? Why might a gene that is being transcribed be repaired faster than a gene that is not being transcribed?	3М

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3A.	Compare the following two In event 1, an incorrect nucle replication and is not correct the next replication. In even mRNA during transcription.	events in ter otide is inse ted by the pr at 2, an inco	rms erted roofr orrec	of ti into ead	heir the ing ucleo	pote e nev or re otide	entia w Di epai e is	al co NA s r sys inse	onse strar sterr ertec	quer nd di ns be d inte	nces uring efore o ar	J P 4	M
3B.	A space probe returns from for study. It has double-str studies of replication of the semiconservative, DNA sym and the lagging-strand temp result?	Jupiter and anded DNA alien DNA hesis is cor lates. What	brir as reve ntinu con	ngs its eal th ous clus	with ger hat, on ions	it a netic alth both car	nev ma ougl n the n yo	wm ateri hthe lea udr	icroc al. I e pr adino raw	orga How oces g- st from	nism ever ss is tranc this	3 3 3	M
3C.	Describe the binding of RNA polymerase, repressors and activators to the lac operon when both lactose and glucose are scarce. What is the effect of these scarcities on transcription of the lac operon?											; ; 3	M
4A.	Describe the molecular activity would you expect an <i>E.co.</i> mutation in the gene for DNA	on of the er // cell to hav ligase?	nzym ve it	ne D fit	NA had	liga a t	ise. æmp	Wh bera	at p ture-	rope sens	erties sitive	6 9 4	M
4B.	What is the function of the T	ATA box in e	ukar	yotio	c pro	omo	ters	?				3	M
4C.	mRNA processing in eukaryo	tes involves	wha	at 3	seq	uent	ial s	teps	s?			3	M
5A.	Mitotic spindle is a microtub mitotic spindle.	ule based m	achi	ne. S	Stat	e the	e ba	sic	feat	ures	of a	¹ 4	M
5B.	Glycosylation of proteins in t	ne endoplasr	nic	retic	ulum	n se	rves	wha	at fu	nctic	on?	3	M
5C.	Describe in steps how the d rise to a chromosome that is	ouble helix o 700 nm in w	f Dl idth.	NA, Y	whic	h is	2 n	m ir	n wic	dth, g	gives	³ 3	M