DEPARTMENT OF BIOCHEMICAL ENGINEERING & BIOTECHNOLOGY

BEL110 : Molecular Cell Biology

Major Test (2006-2007)

Time: 2 hrs
Max. Marks: 40

Q.1(a)	Suppose a patient is suffering from a disorder in which adenylate cylase is deficient. Explain why the infusion of cAMP probably will not remedy the problem ?	[2]
(b)	How will you differentiate between mediated and non-mediated transport across biological membrane?	[2]
(c)	Why is it desirable for the cell to regulate the first reaction in a biosynthetic pathway?	[2]
(d)	What is the role of SDS in polyacrylamide gel electrophoresis?	[2]
Q2.(a)	How does G protein control adenylate cyclase activity?	[2]
(b)	What is the molecular basis for the massive diarrhea that occurs in a human infected with *Vibrio cholerae.*	[2]
(c)	Explain why phorbol esters act as tumor promoting agent?	[2]
(d)	Explain how calcium ionophore (that allows Ca to enter the cell) could mimic the effects of some hormones?	[2]
Q3.(a)	What do you understand by hybridoma? Discuss the method for producing hybridoma cell line.	[1+2]
(b)	Discuss the western blot technique? What are the applications of this technique?	[2+1]
(c)	How does indirect ELISA differ from sandwich ELISA?	[2]
Q4.(a)	How does the genomic library differ from cDNA library? How these libraries are used for gene cloning? What would be advantage of inserting genes coding for resistance to antibiotics into a vector?	[2+2+1]
(b)	Discuss the role of site specific mutagenesis in protein engineering.	[3]
Q5 (a)	Propose an experiment to determine whether a particular amino acid is essential for the activity of an enzyme?	[2]
(b)	Describe the method and Principle of protein purification using (i) Ion exchange chromatography (ii) Gel filtration chromatography	[2+2]
(c)	A baeterial mutant defective in fatty acid synthesis was isolated and grown in growth medium containing a mixture of several types of straight ehain fatty acids, some saturated and some unsaturated, varying in chain length from 10-20 carbon atoms. If one culture is maintained at 18^0C and the other is maintained at 40^0C for several generations, what diffcrence in composition of cell membrane of two cultures you expect to observe and why?	[2]