Department of Biochemical Engineering and Biotechnology
BBL 131: Principles of Biochemistry
Minor I (I semester 2016-2017)

Max. Marks 20
Max. Time 1 hr.

1a	Generally presence of water interferes with the noncovalent interactions such as hydrogen bonding and ionic interactions between enzyme and substrate. What strategy is adapted by biological molecules such as enzymes to optimize such interactions in the presence of water. Explain? (2)
1b.	Whether you expect a storage polysaccharide of a seed to have straight chain or branched structure? Will they retain the same structure during the germination of seeds? Explain giving reasons. (2)
1c.	Many newly synthesized immunoglobulins and peptide hormones contain carbohydrate units with terminal sialic acid residues. What is the biological significance of these terminal molecules explain with the mechanism? (3)
2a	The hydrophobic interactions of the aliphatic side chains of amino acids help to stabilize the folded structure of proteins. What purpose does the variety of sizes and shapes of aliphatic side chains serve? (3)
2b	Why do proteins fold? What is the advantage of quaternary structure over single subunit structure of proteins? (1+1)
2c	In a particular enzyme, a serine residue is located in cleft where the substrate binds. A mutation that changes this residue to a threonine has no effect on the activity, however, another mutation, which changes serine to lysine residue, leads to a complete loss of activity. Provide a brief explanation for these observations. (2)
3a	A linear double stranded DNA molecule in 0.25 M NaCl solution is quite stable, however, as the concentration of NaCl is decreased, the T_m decreases, explain why? (2)
3b	What is the ratio of [S] to K_M when the velocity of an enzyme catalyzed reaction is 80% of V_{max}? (1)
3c	What are allosteric enzymes? Will they have same kinetic behaviour as Michaelis-Menten type enzymes? What do you understand by specific activity of an enzyme? (0.5+1+0.5)
3d	What are catalytic antibodies? How will you synthesize them? (1)