

Department of Biochemical Engineering and Biotechnology

BEL714 Protein Science and Engineering

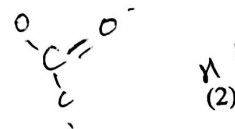
Minor-1 (1<sup>st</sup> semester 2016-17)

Max Marks:25

Time:1 hour

Q.1 Write down the structure of the following peptide:

Trp-Pro-Asp-Lys



Q.2 Antibodies are predominantly made up of beta structures. Is there a molecular reason for the same? Show schematically the arrangement of the hydrogen bonds in anti-parallel beta sheet. Alpha helix has a dipole moment. How does it arise and what functions could be carried out through this?  $1 + 2 + 2 =$  (5)

Q.3 Explain:

How globin fold has been preserved in spite of low sequence identities.

How new enzyme activities have evolved (are new enzymes formed from random sequences generated by recombination or do these arise from a preexisting set of enzyme activities)

Is there any experimental evidence in literature that support your answer? (4)

Q.4 Describe the models put down for helix-helix packing and give suitable examples of proteins that show this packing. Would you expect this packing to be affected by amino acid sequence? Support your answer with concrete examples. (5)

Q.5 Examine the protein structure on the next page (Fig.1) and represent it in the form of a topology diagram. Predict where the active site may be located (3)

Q.6 Explain giving suitable examples:

Domain shuffling and its utility (3)

SCOP database and its implications (3)