**Question 2 Rubric**

 ENZYME QUESTION - 1969 L. PETERSON/AP BIOLOGY

 Proteins functioning as enzymes exhibit precise specifications. Discuss the levels

 of structural organization within proteins which are responsible for specific molecular interactions.

 STANDARDS:

 maximum points = 20

 PRIMARY STRUCTURE (1/2 PT)

 (2) amino acid sequence & number / determining other structures

 peptide bonds

 SECONDARY STRUCTURE (1/2 PT) folding within polypeptide chain

 (4) H-bonds

 Disulfide bonds

 Alpha Helix - globular proteins

 Beta Configuration - fibrous proteins

 TERTIARY STRUCTURE (1/2 PT) further folding of alpha helix

 (4) H-bonds

 Disulfide bonds

 electrostatic forces (interactions)

 van der Waals forces

 QUATERNARY STRUCTURE (1/2 PT)

 (2) Conjugated Proteins - many polypeptide chains

 ENZYMES ARE SPECIFIC BECAUSE OF ACTIVE SITE

 (6) particular shape of molecule

 particular charge distribution

 Coenzymes or cofactors may be required

 Mention of Lock-Key Hypothesis

 Mention of Induced-Fit Hypothesis

**Question 3 Rubric**

 STANDARDS:

 maxiumum points = 13

 PROOF THAT IT IS ORGANIC (1/2 PT)

 PROOF THAT IT IS PROTEIN (1 PT)

 PROTEIN EVIDENCE: (1 PT EACH/MAX, = 5)

 DENATURED under different pH or temperatures

 MACROMOLECULE

 will diffuse through DIALYSIS TUBING if acted on by protease

 centrifugation - large molecule - will be in precipitate

 NINHYDRIN

 will turn blue in presence of amino acids

 CHROMATOGRAPHY

 RATE OF REACTION (1/2 PT)

 (2 PTS EACH/MAX. = 4)

 vary amount of substrate - determine changing rate of reaction;

 should level-off once maximum turnover rate is reached;

 vary pH & temperature - rate of reaction will be at maximum & drop off radically

 on either side;

 INTERACTION BETWEEN ENZYME & SUBSTRATE (1/2 PT)

 X-ray Diffraction

 proof of changes in shape of "enzyme" (3/2 PTS)