

大葉大學 96 學年度 研究所碩士班甄試 招生考試試題紙

系所別	組別	考試科目 (中文名稱)	考試日期	節次	備註
生物產業科技學系		生物化學	12月23日	第一節 8:30~10:00	共2頁 P2-1

註：考生可否攜帶計算機或其他資料作答，請在備註欄註明（如未註明，一律不准攜帶）

I. Simple Choice (2% each)

- Of the 20 standard amino acids, only _____ is not optically active. The reason is that its side chain _____.
 A) alanine; is a simple methyl group B) glycine; is a hydrogen atom C) glycine; is unbranched
 D) lysine; contains only nitrogen E) proline; forms a covalent bond with the amino group
- An octapeptide composed of four repeating glycylalanyl units has:
 A) one free amino group on an alanyl residue.
 B) one free amino group on an alanyl residue and one free carboxyl group on a glycyl residue.
 C) one free amino group on a glycyl residue and one free carboxyl group on an alanyl residue.
 D) two free amino and two free carboxyl groups.
 E) two free carboxyl groups, both on glycyl residues.
- In a conjugated protein, a prosthetic group is:
 A) a nonidentical subunit of a protein with many identical subunits. B) a fibrous region of a globular protein.
 C) a part of the protein that is not composed of amino acids. D) a subunit of an oligomeric protein.
 E) synonymous with "protomer."
- In an aqueous solution, protein conformation is determined by two major factors. One is the formation of the maximum number of hydrogen bonds. The other is the:
 A) formation of the maximum number of hydrophilic interactions.
 B) maximization of ionic interactions.
 C) minimization of entropy by the formation of a water solvent shell around the protein.
 D) placement of hydrophobic amino acid residues within the interior of the protein.
 E) placement of polar amino acid residues around the exterior of the protein.
- A D-amino acid would interrupt an α -helix made of L-amino acids. Another naturally occurring hindrance to the formation of an α -helix is the presence of:
 A) a Pro residue. B) a nonpolar residue near the carboxyl terminus. C) a positively charged Lys residue.
 D) a negatively charged Arg residue. E) two Ala residues side by side.
- An allosteric interaction between a ligand and a protein is one in which:
 A) binding of a molecule to a binding site affects binding of additional molecules to the same site.
 B) two different ligands can bind to the same binding site.
 C) binding of the ligand to the protein is covalent.
 D) multiple molecules of the same ligand can bind to the same binding site.
 E) binding of a molecule to a binding site affects binding properties of another site on the protein.
- Which of the following is *not* correct concerning 2,3-bisphosphoglycerate (BPG)?
 A) It increases the affinity of hemoglobin for oxygen.
 B) It binds with lower affinity to fetal hemoglobin than to adult hemoglobin.
 C) It binds at a distance from the heme groups of hemoglobin.
 D) It is an allosteric modulator.
 E) It is normally found associated with the hemoglobin extracted from red blood cells.
- From the abbreviated name of the compound Gal(β 1-4)Glc, we know that:
 A) C-4 of glucose is joined to C-1 of galactose by a glycosidic bond.
 B) the compound is a D-enantiomer. C) the galactose residue is at the reducing end.
 D) the glucose is in its pyranose form. E) the glucose residue is the β anomer.
- The phosphodiester bonds that link adjacent nucleotides in both RNA and DNA:
 A) always link A with T and G with C. B) are susceptible to alkaline hydrolysis.
 C) are uncharged at neutral pH. D) form between the planar rings of adjacent bases.
 E) join the 3' hydroxyl of one nucleotide to the 5' hydroxyl of the next.
- Compounds that generate nitrous acid (such as nitrites, nitrates, and nitrosamines) change DNA molecules by:
 A) breakage of phosphodiester bonds. B) deamination of bases. C) depurination.
 D) formation of thymine dimers. E) transformation of A to T.
- The conversion of 1 mol of fructose 1,6-bisphosphate to 2 mol of pyruvate by the glycolytic pathway results in a net formation of:
 A) 1 mol of NAD⁺ and 2 mol of ATP. B) 1 mol of NADH and 1 mol of ATP. C) 2 mol of NAD⁺ and 4 mol of ATP.
 D) 2 mol of NADH and 2 mol of ATP. E) 2 mol of NADH and 4 mol of ATP.
- Which of these cofactors participates directly in most of the oxidation-reduction reactions in the fermentation of glucose to lactate?
 A) ADP B) ATP C) FAD/FADH₂ D) NAD⁺/NADH E) Glyceraldehyde 3-phosphate
- Which of the following compounds *cannot* serve as the starting material for the synthesis of glucose via gluconeogenesis?
 A) Glycerol B) acetate C) lactate D) oxaloacetate E) α -ketoglutarate
- Which of the following enzymes acts in the pentose phosphate pathway?
 A) Glycogen phosphorylase B) Aldolase C) 6-phosphogluconate dehydrogenase
 D) Phosphofructokinase-1 E) Pyruvate kinase
- The glycogen-branching enzyme catalyzes:
 A) degradation of (α 1-4) linkages in glycogen B) formation of (α 1-4) linkages in glycogen.
 C) glycogen degradation in tree branches. D) formation of (α 1-6) linkages during glycogen synthesis.
 E) removal of unneeded glucose residues at the ends of branches.
- Cellular isozymes of pyruvate kinase are allosterically inhibited by:
 A) high concentrations of AMP. B) high concentrations of ATP. C) high concentrations of citrate.
 D) low concentrations of acetyl-CoA. E) low concentrations of ATP.