

所別：企業管理學系碩士班 一般類組(丙組) 科目：生物化學(含分子生物學)

I. 單選題:(每題 3 分):(33%)

1. The average amino acid residue weight in a protein of typical composition is about
 - 1) 120 daltons
 - 2) 1200 daltons
 - 3) 120 mg
 - 4) 120 ng
2. An enzyme that catalyze the reaction changes the
 - 1) entropy of the reaction
 - 2) equilibrium constant
 - 3) heat of reaction
 - 4) rate of the reaction
3. Which of the following takes place during oxidative phosphorylation in mitochondria:
 - 1) Electrons are pumped from the intermembrane space to the matrix
 - 2) Electrons are pumped from the matrix to the intermembrane space
 - 3) Protons are pumped from the intermembrane space to the matrix
 - 4) Protons are pumped from the matrix to the intermembrane space
4. ATP is synthesized by _____ routes.
 - 1) substrate-level phosphorylation
 - 2) oxidative phosphorylation
 - 3) photophosphorylation
 - 4) all of above
5. Which of the following types of bonds or interactions are least likely to be involved in stabilizing the three-dimensional folding of most proteins?
 - 1) Disulfide bonds
 - 2) Hydrogen bonds
 - 3) Hydrophobic interactions
 - 4) Ester bonds
6. Approximately how many moles of ATP will be generated as result of the oxidation of one more of NADH_2 in an actively respiring mitochondria?
 - 1) 0
 - 2) 2
 - 3) 3
 - 4) 6
7. The citric acid cycle is controlled primarily by the relative intra-mitochondrial concentrations of
 - 1) NAD^+ and NADH
 - 2) acetyl-Co and pyruvate
 - 3) NADP^+ and NADPH
 - 4) FAD and FADH
8. The _____ is a central pathway for the oxidation of carbohydrates, lipids and proteins.
 - 1) citric acid cycle
 - 2) gluconeogenesis
 - 3) electron transport chain
 - 4) glycolysis

注意：背面有試題

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9. Which of the following enzymes does not use O_2 as substrate

- 1) oxygenase
- 2) oxidase
- 3) hydroxylase
- 4) all of above

10. The biological reduction of nitrogen to form ammonia is called

- 1) ammonia formation
- 2) Harber process
- 3) nitrogen fixation
- 4) nitrogen metabolism

11. Respiration happens in

- 1) plant
- 2) bacteria
- 3) fungi
- 4) all of above

II. 問答題：(45%)

1. 人類基因體研究之進展與未來產業 (15 points)
2. 如何應用生物(生化)科技使工業的二氧化碳減量 (15 points)
3. 如何應用生物(生化)科技產生能源 (15 points)

III. 是非題 (2 points each, 22%)

1. Proteins absorb UV light.
2. DNA absorbs UV light.
3. Catabolism is the process to produce energy
4. Glycolysis occurs only under aerobic condition.
5. β -oxidation occurs only under aerobic condition.
6. Respiration occurs only under aerobic condition.
7. photosynthesis is involved in oxidative phosphorylation.
8. Fermentation is involved in substrate-level phosphorylation.
9. K_m is the affinity of the substrate to its enzyme
10. K_{cat} is the parameter for the catalytic efficiency of an enzyme
11. One gene has only one protein product