國立中央大學103學年度碩士班考試入學試題卷

所別：生命科學系碩士班 分子與環境生物學組(一般生)　科目：生物化學II(含分生)　共 1 頁 第 1 頁
生命科學系碩士班 分子與環境生物學組(在職生)

本科考試禁用計算器　　＊請在試卷答案卷（卡）內作答

I. 單選題：(每題 3 分) (共 24 分)

1. 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

2. 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

3. 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

4. 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

5. Respiration happens in
1) plant　2) bacteria　3) fungi　4) all of above

6. Which of the following enzymes does not use O_2 as substrate
1) oxygenase　2) oxidase　3) hydroxylase　4) all of above

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. ATP is synthesized by _____ routes.
1) substrate-level phosphorylation　2) oxidative phosphorylation
3) photophosphorylation　4) all of above

II. 問答題：(共 76 分)

1. Please explain "genomics. (5 分)
   Please describe the major methodology in the study of genome. (12 分)
2. Please explain "proteomics". (5 分)
   Please describe the major methodology in the study of genome. (12 分)
3. Please explain "restriction enzymes"? (4 分)
   Where can you isolate these enzymes? (3 分)
   How do you purify them? (5 分)
4. What is "polymerase chain reaction"? (5 分);
   舉二個應用的例子 (6 分)
5. Please define "enzyme" ? (5 分)
   列舉酵素催化反應的三種特性? (9 分)
   酵素有何應用? (5 分)