I. 問答題： (共 53 分)

1. 什麼是 DNA 重組 (Recombinant DNA) 技術? 舉一應用的例子 (10 分)
2. 何謂基因改造生物? 對健康與農業有何影響? (10 分)
3. 如何應用生物(生化)科技產生能源 (10 分)
4. 何謂 polymerase chain reaction? 舉一應用的例子 (10 分)
5. 何謂基因體學 (Genomics)? 何謂蛋白體學 (Proteomics)? 對台灣生物(技)產業之影響爲何? (13 分)

II. 是非題 (每題 2 分) (共 14 分)

1. Proteins and DNA absorb UV light.
2. Glycolysis only occurs only at aerobic condition.
3. Respiration occurs only at aerobic condition.
4. One gene has only one protein product
5. The restriction enzyme *Eco*RI is isolated from *E. coli*.
6. cDNA means DNA crossing over
7. Starch and cellulose are composed by glucose

III. 單選題: (每題 3 分) (共 33 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. 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

參考用

注意:背面有試題

4. 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

5. 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

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

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

7. 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

8. ATP is synthesized by _____ routes.

1) substrate-level phosphorylation　　2) oxidative phosphorylation
3) photophosphorylation　　4) all of above

9. 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

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

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

11. Respiration happens in

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

注意：背面有試題