

銘傳大學 103 學年度研究所碩士班招生考試

生物科技學系碩士班

第二節

「生物化學」試題

(第 / 頁共 頁) (限用答案本作答)

可使用計算機 不可使用計算機

A. 單選題 (18%)

- In phase I of glycolysis, the appropriate sequence of enzymes is:
 - phosphofructokinase-1 (PFK-1)
 - hexokinase/glucokinase
 - fructose bisphosphate aldolase
 - phosphoglucoisomerase
 - triose phosphate isomerase (TPI)
 - A, C, B, E, D
 - B, C, D, E, A
 - D, B, C, A, E
 - B, D, A, C, E
 - B, D, E, C, A
- Glucokinase has a K_m value of 10.0 mM, whereas hexokinase has a K_m value of 0.1 mM that is consistent with:
 - glucokinase acting on glucose at low concentrations.
 - glucokinase acting on glucose only at high glucose concentrations
 - glucokinase phosphorylation of most of the glucose at low glucose levels
 - hexokinase acting on glucose only at high levels of glucose
 - hexokinase acting at about half-maximal velocity at glucose concentrations of 4-5 mM
- For phosphofructokinase-1:
 - Low ATP stimulates the enzyme, but fructose-2,6-bisphosphate inhibits
 - High ATP stimulates the enzyme, and fructose-2,6-bisphosphate activates
 - High ATP stimulates the enzyme, but fructose-2,6-bisphosphate inhibits
 - The enzyme is more active at low ATP than at high, and fructose-2,6-bisphosphate activates the enzyme
 - ATP and fructose-2,6-bisphosphate both inhibit the enzyme
- Glyceraldehyde-3-phosphate dehydrogenase belongs to what class of enzymes?
 - oxidoreductases
 - isomerases
 - transferases
 - hydrolases
 - ligases
- In eukaryotic cells, glycolysis occurs in the ____, and the TCA cycle reactions take place in ____.
 - mitochondria; mitochondria
 - cytoplasm; mitochondria
 - cytoplasm; cytoplasm
 - mitochondria; ribosomes
 - cytoplasm; ribosomes
- Which enzymes of the TCA cycle catalyze oxidative decarboxylation reactions?
 - malate dehydrogenase and citrate synthase
 - fumarate and succinate dehydrogenase
 - α -ketoglutarate dehydrogenase and succinate dehydrogenase
 - isocitrate dehydrogenase and α -ketoglutarate dehydrogenase
 - aconitase and succinate dehydrogenase

本試題係兩頁
Exam Printed on 2 pages

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B. 非選擇題 (82%)

1. 任意寫出十個常出現在蛋白質結構中的氨基酸全名、三個字母縮寫以及結構式 (20%)。
2. 請說明蛋白質的一級、二級、三級與四級結構 (12%)。
3. 請說明異位酶的活性調節機制 (allosteric regulation)，包括如何抑制及促進酵素活性 (5%)。
4. 以 lac operon 為例說明基因表現如何受到調控 (5%)。
5. 請比較 DNA 與 RNA 的結構 (4%)。
6. 解釋下列專有名詞: (36%)
 - a. Western blotting
 - b. Ribozyme
 - c. Gluconeogenesis
 - d. T_m
 - e. Ketone body
 - f. Okazaki fragment
 - g. Promoter
 - h. Lactose intolerance
 - i. Urea cycle
 - j. Essential fatty acid
 - k. RNA polymerase
 - l. Fluid mosaic model

本試題係兩面印刷
Exam Printed on 2 sides.

試題完
End of exam