

系所組別：環境醫學研究所乙組

考試科目：生物化學

考試日期：0307，節次：3

※ 考生請注意：本試題 可 不可 使用計算機

1. Define the following terms: (30%)

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|----------------------------|----------------------------|
| (1) Gel Retardation | (2) Apoptosis |
| (3) Tumor suppressor genes | (4) Wobble Hypothesis |
| (5) transposon | (6) Lagging strand |
| (7) Cell cycle | (8) SDS-PAGE |
| (9) Branching Enzyme | (10) Reverse transcriptase |

2. Explain the main functions of microtubules, telomere and telomerase. How those functions are related to cancer therapy? (6%)

3. Give the structures of the four bases in DNA and explain the base pairing of Watson-Crick model. (7%)

4. Compare β -oxidation and biosynthesis of fatty acids with respect to: (a) location of the reactions (b) structures of intermediates during the processes (c) energetics (7%)

5. Draw a diagram and use the diagram to describe how proteins are synthesized in a living human cell. (20%)

6. Describe how Michaelis constant, K_M , and the maximal rate, V_{max} , can be readily derived from rates of catalysis measured at different substrate concentrations if the kinetic behavior of an enzyme follows Michaelis-Menten model. (15%)

7. Draw a diagram and use the diagram to describe how a dioxin molecule binds an aryl hydrocarbon receptor (AhR) and the resulting complex alters gene transcription and protein expression via interactions with dioxin response elements (DREs). (15%)