

本科目不得使用計算機

本科目試題共 1 頁

- 一、 Draw the structures of (1) Methionine; (2) Aspartate ; (3) Cysteine; (4) GTP; (5) Acetyl-CoA. (15 分)
- 二、 Draw and describe the principle of CRISPR/Cas9 system and its application. (15 分)
- 三、 Explain why both ATP and NADPH are required for the operation of the Calvin cycle, and why these two reactants are required in different amounts. (15 分)
- 四、 Briefly describe the biochemical role of the following enzymes in DNA replication in *E. coli*:
(1) DNA helicase; (2) primase;
(3) the 3' → 5' exonuclease activity of DNA polymerase; (4) DNA ligase;
(5) topoisomerases; (6) the 5' → 3' exonuclease activity of DNA polymerase I.
(12 分)
- 五、 Briefly describe the role of recombination in the generation of antibody (immunoglobulin) diversity.
(10 分)
- 六、 解釋名詞 (33 分)
 - (1) site-directed mutagenesis
 - (2) Loop-mediated isothermal amplification
 - (3) K_m (Michaelis constant)
 - (4) operon
 - (5) gel retardation
 - (6) Shine-Dalgarno sequence
 - (7) codon optimization
 - (8) introns and exons
 - (9) posttranslational modification
 - (10) RNA interference
 - (11) scfv