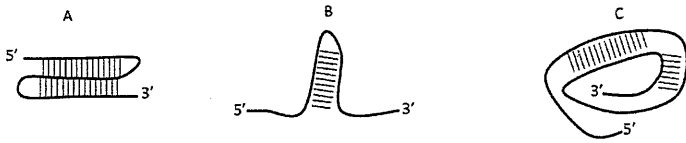
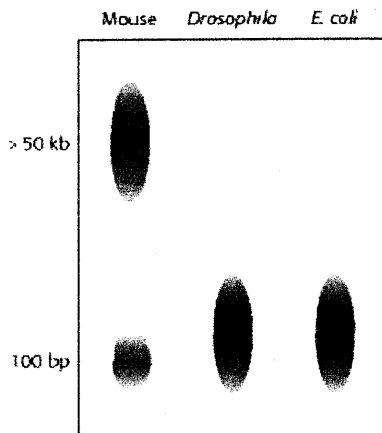


※ 考生請注意：本試題不可使用計算機。 請於答案卷(卡)作答，於本試題紙上作答者，不予計分。

1. What are the functions of vitamin E? (10%)
2. What is meant by posttranslational processing or modification?(10%)
3. Which of the following arrangements is possible in an RNA molecule? The small lines represent Hydrogen bonds.(5%)



4. Outline the structure of a ribosome. (10%)
5. Outline the positions and functions of proteins in membranes. (10%)
6. Why does the liver possess a specific enzyme that can cleave glucose-6-phosphate to form glucose and orthophosphate? (5%)
7. How do our muscle cells maintain glycolysis under anaerobic conditions? (10%)
8. Please describe the five stages in the biosynthesis of cholesterol from acetyl-CoA.(10%)
9. Limited restriction. The restriction enzyme HpaII is a powerful tool for analyzing DNA methylation. This enzyme cleaves sites of the form 5' -CCGG-3' but will not cleave such sites if the DNA is methylated on any of the cytosine residues. Genomic DNA from different organisms is treated with HpaII and the results are analyzed by gel electrophoresis (see the adjoining patterns). Provide an explanation for the observed patterns.(10%)



10. In the Protein Biochemistry module, you analyzed the results of your β -galactosidase purification using SDS-PAGE and Western blotting. The diagrams on the next few pages indicate “expected results” for two different steps in the SDS-PAGE and Western blotting process, along with examples of “bad” results obtained by different student groups at each step. For simplicity, only the following lanes of the gel or Western are shown: MW standards, CL, CL-S, CL-P, AS-S, AS-P.

For each “bad” result:

- (1) Identify the reagent or experimental step that was forgotten/performed incorrectly (“Problem”).
- (2) State the specific observations that led you to this conclusion (“Evidence”).
- (3) State how this reagent/step—when used/performed correctly—allows you to obtain the “expected results” (“Explanation”). (20%)

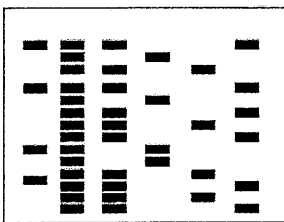
SDS-PAGE gel (Day 4)

(you may assume that all samples were prepared and loaded correctly on the gel)

MW CL CLS CLP ASS ASP
CLP ASS ASP

MW CL CLS CLP ASS ASP

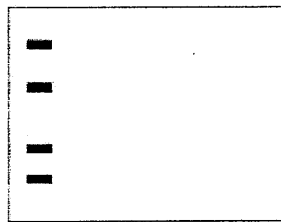
MW CL CLS



“expected” results



Group 1

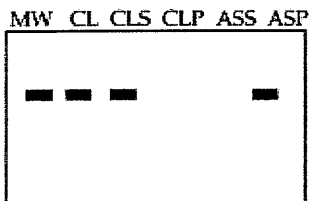


Group 2

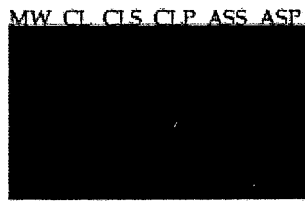
Group	“Problem”	“Evidence”	“Explanation”
1			
2			

Western blotting (Day 6): Nitrocellulose membrane after addition of NBT/BCIP

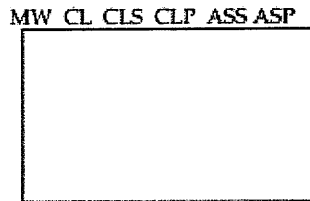
(you may assume that all three groups loaded the same amount of protein in each lane, and that transfer to the membrane was performed successfully)



"expected results"



Group 3



Group 4

Group	"Problem"	"Evidence"	"Explanation"
3			
4			