

※ 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. Please define and compare following pairs (25%):

- (1) environmental monitoring vs. biological monitoring (5%)
- (2) maximum exposure group vs. similar exposure group (5%)
- (3) active sampling vs. passive sampling (5%)
- (4) systemic error vs. random error (5%)
- (5) absorption vs. adsorption (5%)

2. What are the principles for establishing a chemical control banding (CCB)? (10%) What are advantages and disadvantages while using CCB for the control of workers' chemical exposure hazards? (10%)

3. An industrial hygienist is planning for assessing workers' free silica exposures. Please identify a sampler which can be used in this work. Please explain the reasons for the selection of this sampler. (20%)

4. Please design a sampling strategy for assessing workers' thermal hazard exposures. (15%)

5. A worker is exposed to following aerosols containing in the workplace atmosphere:

|   |   |   |    |    |    |    |
|---|---|---|----|----|----|----|
| $d_{ae}$ ( $\mu\text{m}$ )                  | 3 | 5 | 10 | 20 | 30 | 60 |
| Concentration<br>( $\text{mg}/\text{m}^3$ ) | 3 | 5 | 3  | 2  | 1  | 5  |

(1) What is the worker's true total aerosol exposure concentration? (10%)

(2) Will the concentration collected by a total aerosol sampler of the 37-mm filter cassette (sampling flowrate at 2L/min) be higher or lower than the above value? Why? (10%)