

本試題是否可以使用計算機： 可使用， 不可使用（請命題老師勾選）

1. Please compare the use of the charcoal and silica gel tube in sampling gaseous chemicals. (10%)
2. What is the maximum exposure group? (5%) How to decide the maximum exposure group for any given workplace? (5%) How to use the sampling results obtained from the maximum exposure group to assess workers' exposure scenarios? (5%) What are the limitations of using the maximum exposure group to assess workers' exposures? (5%)
3. Please describe factors affecting the selection of filter types. (5%) Please name at least three types of filter used in the field and identify at least one suitable aerosol for collecting by each type of filter. (5%)
4. Please describe mechanisms associated with the collection of particles by filters. (10%)
5. A worker has been exposed to following aerosols:

$d_{ac}$ ( $\mu\text{m}$ )	5	7	10	20	30	50
Concentration (mg/m <sup>3</sup> )	3	5	3	2	1	5

What are his inhalable, thoracic, and respirable aerosol exposure concentrations based on the sampling criteria shown in the following table? (10%)

What are exposure concentrations of the head, trachea-bronchial and alveolar regions of the respiratory tract? (10%)

TABLE 1.2. Inhalable, thoracic, and respirable dust criteria of ACGIH-ISO-CEN.

Inhalable		Thoracic		Respirable	
Particle Aerodynamic Diam. ( $\mu\text{m}$ )	Inhalable Particulate (%)	Particle Aerodynamic Diam. ( $\mu\text{m}$ )	Thoracic Particulate (%)	Particle Aerodynamic Diam. ( $\mu\text{m}$ )	Respirable Particulate (%)
0	100	0	100	0	100
1	97	2	94	1	97
2	94	4	89	2	91
5	87	6	80.5	3	74
10	77	8	67	4	50
20	65	10	50	5	30
30	58	12	35	6	17
40	54.5	14	23	7	9
50	52.5	16	15	8	5
100	50	18	9.5	10	1
		20	6		
		25	2		

6. As an industrial hygienist please design a sampling strategy for assessing workers' noise exposures. (10%)
7. Please describe the way to measure the flow rate for a round ventilation duct. (10%)
8. Please describe sampling efficiencies involved in the samplings of biological agents? (10%)