

國立成功大學  
110學年度碩士班招生考試試題

編 號：290

系 所：環境醫學研究所

科 目：作業環境測定

日 期：0203

節 次：第 3 節

備 註：不可使用計算機

※ 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:

- (1) maximum exposure group vs. similar exposure group (5%)
- (2) gas vs. vapor (5%)
- (3) silica gel sorbent tube vs. charcoal sorbent tube (5%)
- (4) fine particles vs. ultrafine particles (5%)

2. The generated aerosols exposed to workers is known to cause deep lung diseases. As an industrial hygienist, you are assigned to assess workers' exposures. Please identify a sampler which can be used in this work. (10%) Please explain the reasons for the selection of this sampler. (10%)

3. Please describe factors affecting the selection of the type of filter for conducting aerosol samplings. (10%) Please identify the situation where the mix cellulose ester (MCE) filter can be used for collecting aerosols and explain why. (10%)

4. Please describe factors affecting the selection of the type of sorbent tube for assessing workers' gas/vapor exposures. (10%) What are factors affecting the occurrence of break-through for a sorbent tube. (10%)

5. A worker has been exposed to following aerosols:

$d_{ae}$ ( $\mu\text{m}$ )	5	7	10	20	30	50
Concentration ( $\text{mg}/\text{m}^3$ )	3	5	8	2	1	0.5

Please explaining the meaning of inhalable, thoracic, and respirable aerosols. (10%) Please calculate his inhalable, thoracic, and respirable aerosol exposure concentrations based on the sampling criteria shown in the following table. (10%)

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

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