

國立交通大學 107 學年度碩士班考試入學招生試題

科目：人因工程(5061)

考試日期：107年2月2日 第 1 節

系所班別：工業工程與管理學系

組別：工工管系丙組

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【可使用計算機】*作答前請先核對試題、答案卷(試卷)與准考證之所組別與考科是否相符!!

1. Please consider the use of a cell phone or smartphone and then concisely answer the following questions:

- (1) **(10%)** Find an example in its design or use which is based on the concept of “fitting the man to the job (FMJ)” and discuss its pros and cons. (Hint: You may refer to the screening or training of users.)
- (2) **(10%)** Find an example in its design or use which is based on the concept of “fitting the job to the man (FJM)” and discuss its pros and cons. (Hint: You may refer to the redesign of tasks or interactions.)
- (3) **(5%)** Following (1) and (2), in general, which concept (FMJ or FJM) will you recommend? Why?

2. While applying anthropometric data in engineering design, the following two strategies are commonly adopted. For each of them, please **find an example with the key dimension(s) of this design**, as well as specifying **the corresponding body dimension(s) and the percentile(s) to be considered**:

- (1) **(10%)** Determining minimum dimensions of design
- (2) **(10%)** Determining maximum dimensions of design
- (3) **(5%)** Following (1) and (2), in addition to the one-size design, what else strategies can be used to fit the majority of a population?

3. A 40 year old male worker, weighing 70 kg, has to lift a 22 kg bag from the floor and load it into a trolley, Please calculate the spinal compression tolerance limit (SCTL) for the lumbar motion segment L5-S1 (LMS = 48). **(25%)**

4. The following table presents the data on the prevalence of ankle problems in a group of 200 shop workers. The occupational exposure is having to lift a bag from the floor and load it into a trolley. The health outcome is the presence of an ankle problem. As can be seen, there are 30 cases out of a total of 200 workers.

Exposed to loading trolleys?	Ankle Problems		Row Total
	Yes	No	
Yes	22	25	47
No	8	145	153
Total	30	170	200

- (1) What is the overall prevalence rate? **(8%)**
- (2) Calculate the odds ratio (OR). **(9%)**
- (3) Calculate the relative risk (RR). **(8%)**