

國立清華大學 命題紙

98 學年度工業工程與工程管理學系 工業工程 組碩士班入學考試

科目 人因工程 科目代碼 1602 共 1 頁第 1 頁 *請在【答案卷卡】內作答

I. Essays (50%): Please answer each question concisely and to the point. Examples must be given if specified; in other cases, you may also give examples along with your answer to help clarify your points. Handwritten answers must be recognizable and may be done in Chinese as well as in English.

1. Please give a definition to a human-machine system. Based on the degree of manual vs. machine control, please define three possible types of human-machine system with examples in the real world. (15%)
2. You are asked to do a human factors and ergonomics experimental study in a laboratory. Please list, in general, the main considerations for conducting an effective experiment to get an objective conclusion. You may give the answer with an example of your preference. (15%)
3. Please explain the following terms: (4% each, total 20%)
 - (1) Peak clipping of speech.
 - (2) Object display.
 - (3) Warrick's principle.
 - (4) Fitts' law.
 - (5) Accommodation.

II. Please fill in the blanks, each blank is 2%. (Total 50%)

1. The wrist joint can perform flexion / extension and _____ / _____, and circumduction movements.
2. There are many coding methods: shape coding, texture coding, size coding, operational method coding, and etc. can be used. If you are asked to design a traffic sign, which three coding methods are preferred: _____, _____, position coding.
3. While riding a car toward a T-junction, you are required to make a left-turn, the input to this tracking performance system is considered as _____ (sine input, step input, ramp input), and the control order of the system is _____ (zero order, first order, second order).
4. In most expensive Hi-Fi stereo, the movement of tuner control is generally made very smooth, what kind of control resistance feedback can be used _____, and _____ (elastic, static, viscous damping, inertia).
5. The principles in the application of anthropometric data are: design for the _____ individual, design for adjustable range, and design for the _____.
6. In design the peeping hole of a door, which anthropometric dimension should be referenced _____; in design the conveyor height for package department of post office, which anthropometric dimension should be referenced _____.
7. In order to maintain high sensitivity of night vision for aircraft pilots, the display panel should be designed using _____ light. (blue, green, yellow, red); there are two 0.5 watt laser pointers, one is 670 nm, the other is 610 nm, which is preferred _____.
8. The color temperature of the Sun is approximately _____ degrees (1000, 3000, 6000, 12000).; the color temperature of the fluorescent lamp is approximately _____ degrees (1000, 3000, 6000, 12000).
9. The mid-grey color in Munsell color notation is _____, and in CIE system is _____.
10. WBGT index is a weighted average of natural wet-bulb temperature (NWB), _____, and _____.
11. Q10 effect is that for every 1°C increase in _____ temperature, the metabolism increases about 10 percent; heat stress index is the ratio of the body's heat load from metabolism, convection, and _____ to the evaporative cooling capacity of the environment.
12. The sound pressure of a room is 1 N/m², its sound pressure is _____ dBA; if these five noise sources, 43 dBA, 88 dBA, 55 dBA, 88 dBA, and 91 dBA are sounded in the time, the sound pressure level will be _____ dBA.
13. ISO 2631 whole-body vibration standard is basically based on _____, (fatigue-decreased proficiency boundary, reduce comfort boundary, safe exposure boundary).