I. Explain the following terms (3% x 6 = 18%)

1. color temperature
2. core temperature
3. Leq (equal loudness level)
4. radial deviation
5. carpal tunnel syndrome
6. qwerty keyboard

II. Answer the following questions (8% x 4 = 32%)

1. There are 5 color chips, some of them are in Munsell color notation, and some of them are in CIE1931 xyz notation, they are N5, 5G-4/12, 5B-3/14, (0.33,0.33), and (0.3, 0.6). Please point out for me which is in Munsell notation and which is in CIE notation, and tell me the color (approximately)? And what is each value (e.g. "5G", "4" and "12" of the second notation) in the notation stands for?

2. What is octave band – in terms of the relationships between the upper boundry and the lower boundry and the central frequency? And list for me the central frequencies of the octave bands as standized by ANSI and ISO.

3. What control and display coding methods can be used to ensure that a color blind person can identify "red, yellow and green" of traffic light signals?

4. You are asked to design a work stations for three chef personnel each, the first is to cut and split the whole pig or chicken into large chunks (with bones), the second is to slice the small meat chunks into thin slices, and the third is to decorate the dressing of the dish and cake. How and why do you determine the height of a work surface for each of them, assuming they perform their tasks in standing posture.

III. Based on the 1991 revised NIOSH guide for manual lifting, please define RWL and LI, and explain how can it be applied to evaluate the low back injury problem in the workplace (15 %)

IV. Please define the following terms (21 %)

a. sliding filament theory
b. signal detection theory
c. information theory
d. Broadbend's filter theory
e. normal working area/maximal working area
f. forearm pronation and supination

V. Please discuss the differences between physical workload and mental workload. How do you measure the two types of workload? How do they relate to fatigue and job design? (14%)