



DATE: 02 April 2006

TIME: 0930 - 1230 Hours

Total Number of Questions = 09

Number of Questions to be answered = 06

Answer Question 1, which is compulsory and additional five (05) questions.

Question 1 carries twenty-five (25) marks and Questions 2 to 9 carry fifteen (15) marks each.

Compulsory Question

- (a). State the goal of ergonomics and explain what factors need to be considered to achieve these goal?
(04 Marks)
- (b). Ergonomics use the data and techniques of several disciplines. List some of these disciplines.
(02 Marks)
- (c). Physical fitness is an important factor of a human body to function effectively during physical work, training and other activities. What are the five basic components of physical fitness.
(02 Marks)
- (d). Explain two primary types of anthropometrical measurements and give two examples for each type.
(03 Marks)
- (e). What do you mean by "maximal aerobic capacity" and explain how it is related to ergonomics?
(02 Marks)
- (f). Explain the relationship between cognitive ergonomics and work place designing.
(02 Marks)
- (g). Briefly explain why human performance study is important in ergonomics? (02 Marks)
- (h). State four factors that can be used to improve job satisfaction of a worker. (02 Marks)
- (i). To improve the comfort during working, clothing plays an important role. In this regard, clothing creates a microclimate surrounding the body. Name four factors affecting on microclimate.
(02 Marks)

- (j). A person is climbing a stairs (30° inclined to horizontal) and his energy expenditure is 13.7 Kcal /min. Calculate the optimal climbing time. After doing this work, he relaxes by sitting with energy expenditure of 0.3 Kcal/min calculate the relaxing time. (04 Marks)

Answer any five questions from the following eight questions

- Q2. (a). Ergonomics is essentially about "fitting work to people". Explain this statement. (05 Marks)
- (b). Explain how the following benefits are achieved through applying ergonomics principles.

- Productivity
- Safety
- Product quality
- Job satisfaction
- Personal development

(10 Marks)

- Q3. (a). Explain the following terms: "posture", "balanced posture" and "ideal posture".

(06 Marks)

- (b). Explain why proper working postures are important . With the help of suitable examples, discuss the consequences of bad or poor working postures in the garment industry.

(09 Marks)

- Q4. (a). Distinguish between the terms "stress" and fatigue".

(04 Marks)

- (b). Explain the symptoms of stress and fatigue at work.

(06 Marks)

- (c). Give five suggestions that would help improve work conditions and prevent stress and fatigue at work.

(05 Marks)

- Q5. (a). Explain four causes that may lead to stress at work place:

(04 Marks)

- (b). Explain the consequences of workplace stress on both the individual and on the organisation.

(06 Marks)

- (c). Explain any five preventive measures that would help reduce depression at workplaces.

(05 Marks)

- (a). Due to the Sri Lankan hot climate working environment is quite warm and it affects the comfort of the worker. Explain three factors that influence a worker's ability to tolerate hot climate. (03 Marks)
- (b). How could you make desirable thermal conditions in a production floor of a garment factory, by considering air temperature, air humidity and air movement? (06 Marks)
- (c). A factory production flow produces high levels of noise. With the help of suitable examples explain three suggestions that would help reduce high levels of noise. (06 Marks)

- (a). Explain why larger working tables get lower illumination as compared to smaller tables under the same light source. (03 Marks)
- (b). Explain the methods of installing proper lighting system for a cutting table, a sewing place and a pressing (ironing) place, with using suitable diagrams. (06 Marks)
- (c). Explain three effects of improper lighting on manufacturing of products. (06 Marks)

8. (a). Explain the effects of shift work schedules on a worker concerning following aspects:
- Physiological effects
 - Psychological effects
 - Domestic and social factors
- (06 Marks)
- (b). Give four guidelines used for managing shift work in apparel industry. (04 Marks)
- (c). Briefly explain five important individual characteristics that need to be considered when selecting a candidate for shift work. (05 Marks)

9. (a). Give any three ergonomical aspects of human-machine system. (03 Marks)
- (b). Give three guidelines each for designing of the following:
- A display
 - A warning light
 - A control device
- (09 Marks)
- (c). Give two examples for each of the following factors that affect health and safety of a worker.
- Physical
 - Chemical and biological
 - Mechanical
- (03 Marks)

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