

THE OPEN UNIVERSITY OF SRI LANKA  
DEPARTMENT OF TEXTILE AND APPAREL TECHNOLOGY  
POST GRADUATE DIPLOMA IN TECHNOLOGY  
(APPAREL PRODUCTION AND MANAGEMENT)  
FINAL EXAMINATION – 2016/2017  
TTX7140 – HUMAN FACTORS ENGINEERING  
DURATION – 03 HOURS



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Date: 19<sup>th</sup> November 2017

Time: 0930 - 1230 hrs

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Total number of questions = 07

Number of questions to be answered = 05

Each question carries equal marks.

(Q1) The manufacturing organisations have taken different attempts to improve the productivity in different eras. Such five (05) attempts are given below.

Attempt 1 - The organisations attempted to increase the productivity by introducing new machines, tools and equipment.

Attempt 2 - The organisations introduced new methods to improve the performance of the work systems and manufacturing systems.

Attempt 3 - The organisation attempted to improve the performance by improving the design of the tasks, in order to minimise the unproductive efforts.

Attempt 4 - The organisations tried to fit the man to the job/s.

Attempt 5 - The organisations used the concept "Automation" to improve the performance.

Giving examples for each attempt, write a comprehensive note on the five attempts mentioned above. (20 marks)

(Q2) It was found that the amount of overtime paid for the sewing machine operators during the last year is beyond the planned limits of an organization. It was also found that the absenteeism and labour turnover have been increased.

Management of the organisation decided to obtain suggestions from the production managers to overcome the said problems. The production managers suggested the implementation of shift work to avoid such problems.

Giving advantages and disadvantages, discuss whether the suggestion of the production managers is an acceptable solution to the problems. (20 marks)

- (Q3) (a) Briefly explain why different types of work systems are necessary to run a business organization. (06 marks)
- (b) Discuss the dynamic nature of the apparel industry and the challenges face by the workers due to its dynamic nature. (06 marks)
- (c) Describe how the physical forces and psychological forces of human beings influence the performance at work places. (08 marks)
- (Q4) (a) Explain the important characteristics of an efficient production system, which is used in an apparel manufacturing plant. (10 marks)
- (b) Write a comprehensive note on the methods, which can be used for the prevention of the cumulative trauma disorders. (10 marks)
- (Q5) (a) A worker, who works in a manufacturing plant, is subjected to the following noise levels in four different sections of a plant during the eight hours period. Prove that the worker is at risk. (08 marks)

Section	Noise Level	Duration in hours
A	95 dBA	3
B	85 dBA	2
C	80 dBA	1
D	100 dBA	2

- (b) In addition to the given sections in the part (a), the worker has to work in the section E of the plant. The average noise level in the section E is 90 dBA. Prepare the best work plan for the worker, if the worker should work at least one hour in each section. Assume that the total duration of the work is eight hours. (12 marks)
- (Q6) (a) Explain the major design considerations of lighting arrangement of a work place. (10 marks)
- (b) Giving suitable examples, discuss the occurrence of whole body vibration and segmental vibration when performing various types of tasks. (10 marks)
- (Q7) (a) Write a short note on the use of displays and controls in human machine systems. (06 marks)
- (b) Briefly explain the advantages and disadvantages of seated and stand up work places. (06 marks)
- (c) With the help of equations, explain the statistical basis of anthropometry. (08 marks)