

THE OPEN UNIVERSITY OF SRILANKA  
 DEPARTMENT OF TEXTILE AND APPAREL TECHNOLOGY  
 POST GRADUATE DIPLOMA / MASTER OF TECHNOLOGY  
 (APPAREL PRODUCTION & MANAGEMENT)



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FINAL EXAMINATION-2013/2014  
 TTX7131-APPAREL MANUFACTURING TECHNOLOGY  
 DURATION- 3 HOURS

Date: 18<sup>th</sup> August 2014

Time:0930-1230hrs

Total number of questions: 08

Answer **six (06) questions only.**

- Q1. (a) In the apparel industry, product development evolves in three phases. What are those phases and briefly explain the activities involves in **each phase** to develop a garment style. (30 marks)
- (b) Sri Lankan apparel industry faces the higher lead time problem very often. Briefly explain any four (04) reasons causing for this problem. (40 marks)
- (c) Briefly explain why supply chain management is important in apparel manufacturing business. (30 marks)

- Q2. (a) "Good sourcing gives number of benefits to manufacturing firms" Briefly explain this statement with giving suitable examples. (30 marks)
- (b) A garment factory has received eight different orders. The details of the received orders are given in following Table. Production planning manager has assigned you to prepare a production plan for the sewing section to complete these eight orders. The factory has a weekly capacity of 100,000 SMV and there are 60 operators organized into 4 lines. If the factory works on a 5 days per week,

Order	A	B	C	D	E	F	G	H
No. of garments	7,000	7,500	4,500	27,000	10,000	5,000	8,000	5,500
SMV/garment	5	8	10	5	8	6	5	10
Week due	2	4	6	6	4	2	3	6

- (i) Draw a Gantt chart to indicate the delivery of the eight orders in time.
- (ii) Deduce the available capacity (total available load in SMV) of the plant at the end of the sixth week, in order to accept several new orders. (60 marks)

- (c) A production line of 22 operators works for 450 minutes in a day with 75% performance efficiency. Assume the percentage of absenteeism of the factory is 13%. This factory receives a order of 12 SMV per garment. Calculate the capacity of the production line per day. (10 marks)
- Q3. (a)** "Cutting cost and the end waste show the different behaviors with increasing the length of the marker". Justify this statement with giving suitable examples. You may draw a suitable sketch describe your answer. (30 marks)
- (b) Briefly explain how would you evaluate the seam appearance and seam performance in apparel manufacturing (30 marks)
- (c) Briefly explain how the following factors affect on the strength of a seam. You may consider the different variations available under each factor.
- (i) Fabric type and GSM ( $\text{g/m}^2$ )      (ii) Stitch and seam construction
- (iii) stitch density      (iv) Stitch balance (40 marks)
- Q4. (a)** Write a short account on following special techniques used in apparel industry. You may consider the principle, applications, advantages and any limitations of the each technique.
- (i) High frequency welding      (ii) Ultra sonic welding (40 marks)
- (b) Briefly explain any three (03) problems encountered with fusing operation with mentioning their effect of apparels. (30 marks)
- (c) Write a short note on laser welding including the process, benefits, limitations and applications. (30 marks)
- Q5. (a)** Compare the flexible manufacturing systems such as unit production system (UPS) and Modular production system (MPS) with the conventional manufacturing system used in apparel industry. (30 marks)
- (b) Clothing get soiled during manufacturing as well as in usage. Detergents are used to remove the soils from the clothing in general washing. Briefly explain the mechanism of removing soils from the cloth due to the action of detergent used. (40 marks)
- (c) Write short notes on following special washing techniques.
- (i) Stone washing      (ii) Enzyme washing (30 marks)

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Q6. (a) Briefly explain why garment dyeing has become more popular in apparel industry. (30 marks)

(b) Briefly explain why durable press treatment frequently done on fabrics and most garments? (30 marks)

(c) Write short notes on the following.

(i) Shrink proofing of wool with enzymes

(ii) Handle modification on wool using enzymes

(iii) Bio polishing on cotton using enzymes

(iv) Bio stoning on cotton using enzymes (40 marks)

Q7. (a) Explain why needle temperature is a very important factor to be considered in sewing? (25 marks)

(b) Write a short on how the needle temperature varies with needle parameters, fabric parameters and sewing thread parameters. (45 marks)

(c) Explain how the needle penetration force varies with the GSM (Fabric weight density) and needle point form. (30 marks)

Q8. (a) Briefly explain the various functions that can be performed by a wearable mother board of a smart shirt. (30 marks)

(b) Briefly explain the applications of Phase changing materials (PCM) in textile industry. (30 marks)

(c) Write a short note on applications of nano-technology in textile and apparel sectors. (40 marks)