



Name :
Roll No. :
Invigilator's Signature :

CS/B.TECH (APM)/SEM-5/APM-503/2011-12

2011

APPAREL PRODUCTION CONTROL

Time Allotted : 3 Hours

Full Marks : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

GROUP - A

(Objective Type Questions)

1. Answer the following questions : 10 × 1 = 10
- A. Choose the correct alternatives for the following :
 - i) "SAM for Pocket attaching operation for style no. 0013/AP is 2 minutes." This statement indicates
 - a) minimum time required to attach one pocket for style no. 0013/AP = 2 minutes
 - b) maximum time required to attach one pocket for style no. 0013/AP = 2 minutes
 - c) average observed time for attaching one pocket for style no. 0013/AP = 2 minutes
 - d) allotted time estimated for attaching one pocket for style no. 0013/AP = 2 minutes.



- ii) "Performance rating of a worker = 80%." This statement indicates
- a) average working efficiency of that worker = 80%
 - b) that worker can perform 80% of the standard performance.
 - c) maximum working efficiency of that worker = 80%
 - d) that worker can perform 80% of the most efficient worker in that factory.
- iii) Which of the following control charts is useful to optimize machine-wise manpower allocation ?
- a) Two handed Process Chart
 - b) Multiple Activity Chart
 - c) Operation Process Chart
 - d) Flow Process Chart.
- iv) Flow Process Chart is a useful tool for
- a) Production Calculation
 - b) Production Control
 - c) Production Planning
 - d) Lay Lot Planning.
- v) Which of the following parameters is not required for calculating manpower requirement for a process in sewing department ?
- a) SAM
 - b) Performance rating %
 - c) Absenteeism %
 - d) Fabric consumption.



- vi) Which of the following parameters influences Lay lot planning most significantly ?
- Marker
 - Fabric colour
 - Total number of fabric rolls available
 - All of these.
- vii) In an Apparel factory with computerized sewing machine and effective ERP system, which of the following productivity calculation systems is the most suitable one ?
- Operator productivity
 - Labour productivity
 - Machine productivity
 - none of these.
- B. Answer the following questions very briefly :
- viii) Mention one example each for 'Make Through Process' and 'Progressive Bundling Process' of Apparel Manufacturing.
- ix) Write the full forms of AOA and AON.
- x) Mention any three activities to improve productivity in sewing department.

GROUP - B

(Short Answer Type Questions)

Answer any *three* of the following. $3 \times 5 = 15$

2. Write short notes on the following :
- Skill inventory in the context of manpower allocation in sewing department
 - Fashion calendar for product development.

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3. Details of an order of 2500 pcs Men's Trousers are as given below :

Date of Order Confirmation : 22nd November, 2011

Date of Delivery : 20th December, 2011

Style No. : AD/M/013

Colour No. : Pantone-IP00027.

Total Number of Pcs ordered : 2500

Standard time required

For Faibric sourcing : 7 days

For Fabric inspection : 6 days

For Cutting : 4 days

For Sewing : 22 days

For Washing and Ironing : 12 days

For Final inspection and Packing : 7 days

Illustrate a suitable production planning through Gantt chart for the above mentioned order.

4. Prepare a suitable check list for cutting operation to avoid errors.

5. The sewing machine operators in an apparel factory are expected to work for 400 minutes in a shift of 8 hours. The remaining time is meant for rest and personal needs etc.

a) Determine the Standard time for attaching a single piece of pocket, whose normal time (basic time) is 3 minutes.

b) Calculate number of pockets to be attached per shift.

c) If the operator engaged on the above job completed pocket attaching for 80 pcs of Style no. ZEN/10/011, where ZEN/10/011 is described as "2 pocket P/C blended men's formal shirt on plain", calculate the productive efficiency of that operator.

2 + 1 + 2



6. Details of orders in hand as on 22nd November, 2011 in M/s Karley Export are given.

a) Order No.1537 : Style No. 3200 :

Colour Pink/002 : Size M – 100 pcs, Size L – 120 pcs,
Size XL – 50 pcs

Colour Red/005 : Size M – 80 pcs, Size L – 100 pcs,
Size XL – 50 pcs

Style No. 4300 :

Colour Green/002 : Size M – 200 pcs, Size L – 150 pcs,
Size XL – 80 pcs

b) Order No. 1231 : Style No. 4100 :

Colour Pink/002 : Size M – 100 pcs, Size L – 120 pcs,
Size XL – 50 pcs

Style No. 3200 : Colour Black/012 :

Size M – 100 pcs, Size L – 120 pcs, Size XL – 50 pcs

Colour Pink/002 : Size M – 120 pcs, Size L – 130 pcs,
Size XL – 70 pcs

c) Order No. 1432 : Style No. 5222 :

Colour Green/002 : Size M – 300 pcs, Size L – 250 pcs,
Size XL – 180 pcs

Style No. 3200 :

Colour Red/005 : Size M – 200 pcs, Size L – 150 pcs,
Size XL – 80 pcs

Colour Pink/002 : Size M – 200 pcs, Size L – 150 pcs,
Size XL – 80 pcs

Prepare an order concentration chart for Style No. 3200.



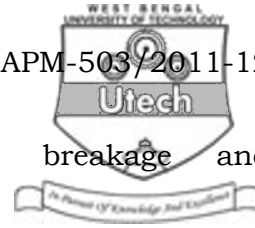
7. a) Assume that 2000 men's kurtas must be made in one 40 hour week. Given information are as under :
- Standard work content per garment = 10 minutes
Predicted attendance = 95%
Predicted utilization = 90%
Predicted performance rating = 90 % against BSI
- Calculate estimated number of operators required for the order mentioned above.
- b) What do you mean by 'Throughput time' ? Explain with a suitable example. 3 + 2

GROUP - C

(Long Answer Type Questions)

Answer any *three* of the following. $3 \times 15 = 45$

8. a) Describe a suitable set of sequential steps involved in improving the productivity in Apparel Industry.
- b) The activities undertaken by an operator of a high speed computerized 20 head embroidery machine are as observed under for a particular day :
- Threading : 15 minutes
Framing : 8 minutes
Loading of Design to the CPU : 4 minutes
Automatic Embroidery (1 full repeat) : 35 minutes



M/c stoppage due to thread breakage and knotting : 8 minutes

M/c stoppage due to power failure : 5 minutes

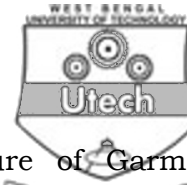
Taking off the embroidered fabric : 4 minutes.

Prepare a multiple activity chart and calculate capacity utilization % of man and machine in the given work cycle. 7 + 8

9. a) An assembly operation in Sewing Department consists of five elements with following observed times and the performance rating.

Element	Observed Time in Seconds	Performance Rating %
Lifting feed dog and feeding fabric	12	80
Adjusting fabric position against notch mark	10	
Sewing	10	
Lifting feed dog and taking off the piece	5	
Dropping the piece inside the bin	3	

Taking standard process + machine delay allowance as 5% of basic time and assuming rest + personal allowance as 40 minutes and contingency allowance as 10 minutes per shift of 8 hours, calculate standard allowed time per piece.



b) The following represents the procedure of Garment washing as observed on 20th March, 2011 in M/s Gokul Fashions :

- i) Bunch of garments (40pcs) are taken from the intermediate storage rack and carried up to the washing machine (5 m away from the rack) : Time taken 2 minutes
- ii) Filling of water to the washing machine : 2 minutes
- iii) Adding Detergents : 0.5 minute + Delay of 1.5 minutes for unavailability of the required detergent in proper place.
- iv) Mixing detergents : 1 minute
- v) Checking & loading of garments to the washing machine : 5 minutes
- vi) Tumble Washing Cycle : 30 minutes
- vii) Unloading of garments : 4 minutes + delay of 1.5 minutes due to unavailability of trolley in proper place.
- viii) Carrying the garments up to the Hydro extractor (2.5 m away from the washing machine) : 0.2 minutes.

Draw a Flow Process Chart for the above mentioned activities. 6 + 9



10. a) Explain the factors to be considered in making a plan for Apparel Product Development.
- b) Mention in brief the basic characteristics, advantages and disadvantages of different manufacturing processes generally adopted in Apparel Industry. Illustrate with suitable flow chart. 5 + 10
11. a) In a knitted T-Shirt Manufacturing Factory M/s A.P. Garments, the data on the output and various inputs are as mentioned below :
- Total number of machines per shift : 80
- Total number of operators allotted per shift : 82
- Total number of helpers per shift : 08
- Total number of checkers per shift : 10
- Total number of supervisors per shift : 2
- Product Sewn : Men's Half Sleeve Casual T-Shirt
- SAM of the Shirt (Sewing) : 17 minutes
- Average output per shift of 8 hours : 1500 shirts
- Calculate the following :
- i) Operator Productivity (Sewing)
 - ii) Machine Productivity (Sewing)
 - iii) Average Productive Efficiency per Machine (sewing)
 - iv) Total Labour Productivity (Sewing)



b) In M/s Zenith Apparels, the following information are collected :

Total available working time per shift = 450 minutes,
 Average absenteeism 2%, Average factory performance = 90%,
 Rework = 10%, Rejection = 3%, Machine delay = 1%,
 Process delay = 5%, Misc. Delay (power failure, machine break down, maintenance etc.) = 2%.

- i) Draw a curve to illustrate detailed break-up of the causes of loss in productivity
- ii) Determine the productivity percentage. 8 + 7

12 a)

Activity	Must Precede	Optimistic Time (days)	Pessimistic Time (days)	Most Likely Time (days)
A	none	2	4	3
B	A	1	3	2
C	B	6	8	7
D	C	5	7	6
E	C	4	6	5
F	D	3	5	4
G	E	1	3	2
H	G	3	5	4
I	F+H	1	3	2

Calculate the following :

- i) Expected duration of completion for each activity
 - ii) Earliest and latest finish of each activity
 - iii) Earliest finish of the entire project
 - iv) Slack time for each activity
- b) Define 'DELAY', 'STORAGE' and 'INSPECTION'. 12 + 3



13. a) What do you mean by 'Line Balancing' ? Briefly explain the steps involved in line balancing with a suitable example.

b) Production order details as on 25th November, 2011 in M/s Amrutha Apparels are as follows :

Production Order No. 1135

Style No. : 6132

Colour Red : X Size - 140 pcs, L Size - 280 pcs,
XXL Size - 70 pcs

Colour Purple : X Size - 200 pcs, L Size - 400 pcs,
XXL Size - 100 pcs

Make a suitable cut order plan assuming maximum no.
of ply per spread = 40. 9 + 6