

**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

B. Sc. Engineering 4th Year 1st Term Examination, 2018

**IPE 4121**

(Industrial Management)

Time: 3 Hours

Total Marks: 210

- N.B.:** i) Answer any THREE questions from each section in separate scripts  
ii) Figures in the right margin indicate full marks.  
iii) Assume reasonable data if missing any.

**SECTION-A**

- 1(a) Write down the differences between management and administration. 10  
1(b) Explain contingency theory school with suitable example. 10  
1(c) Discuss the factors which influence the span of management. What should a manager do to increase his span of management? 15

- 2(a) What is MBO? Discuss the steps involved in the MBO process. 12  
2(b) Discuss the 14 principles of management by Henri Fayol. 10  
2(c) Define organization and organizational structure. Write down the conditions for effective functioning of committees. 13

- 3(a) Forecast based on averages. Given the following data: 15

Period	Number of complaints
1	60
2	65
3	55
4	58
5	64

Prepare a forecast using each of these approaches-

- i) The appropriate naive approach  
ii) A three period moving average  
iii) A weighted average using weights of 0.50 (most recent), 0.30 & 0.20  
iv) Exponential smoothing with a smoothing constant 0.40.
- 3(b) Define forecasting error. Write down the different forecasting errors with their respective equations. 10  
3(c) Briefly explain the different tools of decision making. 10
- 4(a) Distinguish between the centralization & decentralization in organizational structure. 10  
4(b) Write down the characteristics of useful information. Discuss the outputs of MIS. 15  
4(c) Briefly explain different types of business in terms of ownership. 10

**SECTION-B**

- 5(a) Define leader and leadership. Compare and contrast transactional and transformational leadership styles. 10  
5(b) Differentiate between recruitment and selection of employees. Why selection is called a negative process? 12  
5(c) What are the key motivational techniques? How a person can be motivated negatively in an organization? 13
- 6(a) Differentiate between Job evaluation and merit rating. Briefly explain employee comparison method for Job evaluation. 12  
6(b) A job is rated in terms of wages of TK 800 per day. The standard time set for the Job is 15 days, 8 hrs / day. Four workers have taken 100,110,120 and 140 hrs respectively for the completion of the job. A bonus of 75% on the time taken will be given only to those who have completed the job in the standard time. Calculate the earning of individuals by Halsey Plan. 13  
6(c) Explain Bedaux plan with necessary figure. 10

- 7(a) Define TQM. Write down the different aspects of quality. 10
- 7(b) Write short notes on: 14
- (i) Fishbone diagram
  - (ii) Pareto analysis
- 7(c) What is 5S? What are the principles of 5S?-Explain. 11
- 8(a) What is meant by Lean? Explain key lean manufacturing principles with mentioning the rules to become a lean. 15
- 8(b) Define and describe the quality circle. 10
- 8(c) Define BGMEA. What are the main functions of BGMEA? 10

-----THE END-----

**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

B. Sc. Engineering 4th Year 1st Term Examination, 2018

**TE 4133**  
(Technical Textiles)

Time: 3 Hours

Total Marks: 210

- N.B.:** i) Answer any THREE questions from each section in separate scripts  
ii) Figures in the right margin indicate full marks.  
iii) Assume reasonable data if missing any.

**SECTION-A**

- 1(a) Differentiate between traditional textiles and technical textiles. 05  
1(b) Discuss the applications of technical textiles in Agro-tech and Oeko-tech. 10  
1(c) Describe various technologies used manufacturing technical textiles. 10  
1(d) Discuss about recent developments of technical textiles. 10
- 2(a) Show the flowchart of constituent element of medical textile product. 05  
2(b) Define with examples: (i) Degradable fibers (ii) Non-degradable fibers (iii) Resorbable fibers. 10  
2(c) What are the required characteristics of infection control barrier hospital textiles? 10  
2(d) Mention the applications of implantable medical textiles with fabric structure. 10
- 3(a) Briefly classify geo-textiles. 10  
3(b) Write short notes on: (i) Geo-grid (ii) Geo-pipe & (iii) Geo-membrane. 10  
3(c) What are the basic functions of geo-textiles and describe three of them. 15
- 4(a) What are the fiber requirements for car seat? 05  
4(b) Define airbag. Discuss the basic mechanism of air bag used in automotive textiles. 15  
4(c) What is tyre cord yarn and tyre cord fabric? 05  
4(d) Describe about tyre construction with neat sketch. 10

**SECTION-B**

- 5(a) State the process of making the substrate preparation for coating. 13  
5(b) What are the advantages of using PVDC coating, explain. 07  
5(c) Why powder coating is called environment friendly process? 05  
5(d) Write down the factors required for evaluating the performance of laminated fabric. 10
- 6(a) What is meant by smart textile? Write down the benefits of using smart textiles. 10  
6(b) Narrate the wearable technology required for smart snow clothing. 12  
6(c) Define conductive textile. State the process of making conductive textiles. 08  
6(d) Explain how 'Bio-mimic' works? 05
- 7(a) Define protective clothing. Briefly describe fire retardant clothing. 12  
7(b) Which natural fibre can be used for extreme cold protective clothing and why? 05  
7(c) Write short notes on: (i) Radiation protective clothing (ii) Clear room textiles (iii) Chemical protective clothing. 18
- 8(a) Explain-'Filtration is one kind of separation process.' 05  
8(b) State the advantages of using synthetic fibers as filter media. 08  
8(c) Define separation membrane. State the mechanism and application of separation membrane. 12  
8(d) Make a comparative study among micro, ultra and nano filtration with adequate discussion. 10

-----THE END-----



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**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

**B. Sc. Engineering 4th Year 1st Term Examination, 2018**

**TE 4113**

**(Textile Testing and Quality Control-II)**

Time: 3 Hours

Total Marks: 210

**N.B.:** i) Answer any THREE questions from each section in separate scripts

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

**SECTION-A**

- 1(a) What is Oeko-Tex 100? State the different categories of Textiles according to Oeko-Tex 100. 10
- 1(b) What is ASTM? Write down the garment-categories as per ASTM. 10
- 1(c) Mention the name of some compliance organization. 05
- 1(d) Write short notes on: (i) REACH (ii) ECha 10
- 2(a) What is BAN? Mention the standard value of its. If this value becomes more or less; what steps will be taken for the dye bath for standard dyeing? 07
- 2(b) Describe the BAN for estimation of mercerization of the fabric. 10
- 2(c) Why starch is removed from the fabric? How will you identify the presence of starch and or PVA in fabric? Explain. 18
- 3(a) Point out the standard human body temperature as per medical science. When do men feel discomfort? 08
- 3(b) What is TOG & TOG meter? Show the relation between TOG & CLO. 05
- 3(c) How will you measure the water permeability of fabric? Describe in details. 15
- 3(d) State the types of breathable fabrics. 07
- 4(a) Describe the different flame test. 15
- 4(b) Mention the following items for 45<sup>0</sup>flame test:- 15  
(i) Sample preparation (ii) Interpretation of results & (iii) What this test is used for?
- 4(c) Write short note on flame resistance finish. 05

**SECTION-B**

- 5(a) Write down the demerits of both wearer trials and laboratory tests. 10
- 5(b) Briefly discuss the factors affecting abrasion resistance. 05
- 5(c) What is tearing strength? Show an established tearing strength test method. 10
- 5(d) State a bursting strength test according to a standard. 10
- 6(a) What is color fastness? Describe a test of color fastness to wash according to an established standard. 12
- 6(b) Show the different light sources used in textile testing. 03
- 6(c) Discuss a test of color fastness to rubbing mentioning the standard. 12
- 6(d) State the evaluation procedure of color fastness to light maintaining a standard. 08
- 7(a) Show a format of a test report of color fastness to perspiration indicating the standard. 08
- 7(b) Describe a carpet thickness test. 08
- 7(c) What is durability of a carpet? Show a durability measurement test of a carpet. 10
- 7(d) Write short notes on: (i) Multifibre fabric (ii) Blue wool (iii) Gray scales 09
- 8(a) Show a comparison of ISO and AATCC test of color fastness to rubbing. 05
- 8(b) Describe a hydrostatic head test. 06
- 8(c) State the Bundesmann water repellency test with the evaluation procedure. 08
- 8(d) What is pilling? Describe a pilling test mentioning the evaluation procedure. 10
- 8(e) Briefly explain the reasons of both pilling and snagging. 06

-----THE END-----

**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

B. Sc. Engineering 4th Year 1st Term Examination, 2018

**TE 4107**

(Apparel Manufacturing Engineering-III)

Time: 3 Hours

Total Marks: 210

- N.B.:** i) Answer any THREE questions from each section in separate scripts  
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iii) Assume reasonable data if missing any.

**SECTION-A**

- 1(a) Why industrial garments washing are so popular nowadays? 07
- 1(b) Write down the functions of the following chemicals in industrial garments washing- 05
- (i) Potassium permanganate
  - (ii) Acetic Acid
  - (iii) Bleaching powder
  - (iv) Caustic Soda
  - (v) Detergent
- 1(c) Describe Desize + Enzyme + Softener wash for 80 Kg. of twill white long pant with standard process recipe. 10
- 1(d) What is Super White Wash? Write down the process of Super White Wash of 100 kg cotton shirt with standard process recipe. 13
- 2(a) Write down the process sequence of acid wash of 80 kg of sweater. 10
- 2(b) What is caustic wash? Mention the limitations of hypochlorite bleaching. 08
- 2(c) Briefly discuss the precautions that should be taken before garments dyeing. 10
- 2(d) Why garments dyeing process is apparently a trend in apparel industry? 07
- 3(a) Calculate the consumption per dozen of a knit trouser. Consider fabric GSM = 280. Assume all other parameters and all parameters must be usual. 15
- 3(b) If one shirt contains 09 pcs buttons of 18L and 02 pcs buttons of 14 L, Calculate the lignewise requirements of buttons in Great Gross for manufacturing fifty thousand shirts. 05
- 3(c) Establish the mathematical expression to estimate thread consumption of stitch class-301. 07
- 3(d) Depict a relation between garment design and comfort. 08
- 4(a) How vapour permeability of textiles can be measured by invert desiccant method? Describe. Discuss the suitability of this process over other processes. 10
- 4(b) Narrate the probable reasons of feeling discomfort during clothed situation. 08
- 4(c) Why PMV is used? Mention the thermal comfort range suggested by researches using 7 point PMV scale. 07
- 4(d) Write short notes on- 10
- (i) Body heat balance equation
  - (ii) Tog meter

**SECTION-B**

- 5(a) Explain why and how resin is applied on garment to make wrinkle washing? 10
- 5(b) Depict the basic mechanism of laser engraving with neat sketch. 12
- 5(c) How color patch and color spray can be done over a denim pant to create unique look? 05
- 5(d) Discuss the process sequence of the following dry processes: 08
- (i) Ozone fading
  - (ii) Destroying
- 6(a) Briefly discuss the schematic processes involved while conducting final inspection. 13
- 6(b) State different types of sewing faults with causes and remedies. 12
- 6(c) Write down the key points required for button inspection. 10
- 7(a) List out the substances that are commonly considered as restricted in apparel. 05
- 7(b) Why presence of 'Formaldehyde' is highly restricted in apparel industry? Describe the 15

- regulations across the world about 'Formaldehyde' content in apparel.
- 7(c) State the test method to determine the existence of 'lead' content in the garment. 10
- 7(d) How the presence of 'Phthalates' in clothing affects human body adversely? 05
- 8(a) Define the term 'Sew ability'. Assume for a lock stitch, stitch per inch (SPI) is 10, single thread strength (STS) is 1.1 kg. Calculate the seam strength. 10
- 8(b) What preventive steps you can take to avoid 'Thread failure' and fabric rupture? 08
- 8(c) Discuss different types of washing process that can be used for specific localized fading. 10
- 8(d) What is needle cutting index? What are the reasons behind this cutting? 07

-----THE END-----



**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

B. Sc. Engineering 4th Year 1st Term Examination, 2018

**TE 4105**

(Wet Processing Engineering-III)

Time: 3 Hours

Total Marks: 210

- N.B.:** i) Answer any THREE questions from each section in separate scripts  
ii) Figures in the right margin indicate full marks.  
iii) Assume reasonable data if missing any.

**SECTION-A**

- 1(a) What is pigment dyeing? Why pigment dyeing is so familiar in garments dyeing at recent time? 08
- 1(b) What types of problems can be visible on fabrics after pigment dyeing? Mention that problems with proper reasons. 07
- 1(c) Why cationic pretreatment is done at cotton fabric before pigment dyeing? How many ways this pretreatment can be done? 08
- 1(d) Do you think reactive fluorescent and pigment fluorescent are dyed at same conditions? If yes or not, explain your argument with mentioning proper dyeing conditions of both processes. 12
- 2(a) What are the differences between foam and emulsion? Write down the reasons for using foam in wet processing. 10
- 2(b) Describe the mechanism of foam formation with proper sketch. 08
- 2(c) Write down the functions of different parts at air flow dyeing machine. Why air flow dyeing is more convenient for low liquor ratio dyeing? Explain with proper mechanism of dyeing m/c. 12
- 2(d) What are the advantages of 1-shape air flow dyeing m/c? 05
- 3(a) What is plasma? Write down the basic principle of plasma treatment on textile fabric with diagram and reactions. 10
- 3(b) State the different applications on textile materials by using various plasma 08
- 3(c) Why DBD plasma is suitable for textile application? Explain. 05
- 3(d) Describe the plasma etching and grafting process with proper sketch. 12
- 4(a) What is super critical fluid? How can you dye the textile material using Sc-CO<sub>2</sub> as solvent? Explain with figure. 10
- 4(b) Differentiate between conventional water-dyeing and supercritical CO<sub>2</sub> dyeing. 08
- 4(c) What is mordant dye? Describe the types of bond that are formed between a mordant dye and mordant. 07
- 4(d) Describe the dyeing procedure of cotton fabric with natural dyes for pre and post mordanting process. 10

**SECTION-B**

- 5(a) Write down the difference between nerist and freundlich isotherm with graphical representation. 10
- 5(b) How electrical double layer is formed during dyeing mechanism? Explain with valid reason. 09
- 5(c) What is free energy? How free volume influences dyeing diffusion? 09
- 5(d) How dye aggregation can be minimized? 07
- 6(a) Is temperature static during dyeing? Why & when it varies? 07
- 6(b) How dyeing becomes faulty due to improper controlling of dyeing parameters? Explain with valid points. 09
- 6(c) What is aquachron wash? Which dyeing machine has this special feature? 05
- 6(d) Why proper washing is necessary before neutralization of fabric dyed with reactive dye? 05
- 6(e) Write down the function & application temperature of below auxiliaries:- 09
- (i) Sequestering agent
- (ii) Stabilizer

- (iii) Anticreasing agent
  - (iv) Enzyme
- 7(a) What kind of information which we get from lab-dip? Why lab-dip approval is necessary prior to bulk production? 09
- 7(b) What is fabric entangle during dyeing? How this can be avoided? 07
- 7(c) Differentiate between linear & progressive dosing with curve. 07
- 7(d) What is heat exchanger in dyeing machine? How it affects the fluctuation of temperature in dyeing machine. 06
- 7(e) Define below items:- 06
- (i) Desorption
  - (ii) Exhaustion
  - (iii) Migration
- 8(a) What is S/O? Describe the checking points of S/O approval. 07
- 8(b) What is synthetic thickener? Why synthetic thickener is used instead of emulsion thickener? 08
- 8(c) Differentiate between flat and rotary screen printing. 06
- 8(d) What is viscosity of print paste? How it affects the hydrodynamic pressure in print paste? 05
- 8(e) Write short notes on: 09
- (i) HLB value
  - (ii) Half emulsion
  - (iii) Blotch Print.

-----THE END-----

**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

B. Sc. Engineering 4th Year 1st Term Examination, 2018

**TE 4103**

(Fabric Manufacturing Engineering-II)

Time: 3 Hours

Total Marks: 210

- N.B.:** i) Answer any THREE questions from each section in separate scripts  
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iii) Assume reasonable data if missing any.

**SECTION-A**

- |      |   |    |
|------|---|----|
| 1(a) | Why weft replenishment motion is necessary?   | 05 |
| 1(b) | Describe the working principle of two prong electrical feeler.                                      | 15 |
| 1(c) | Classify stop motions.  | 05 |
| 1(d) | Sketch electrical warp stop motion mechanism with proper labeling.                                  | 10 |
| 2(a) | Briefly describe the centre weft fork mechanism with its advantages.                                | 15 |
| 2(b) | Make a list of differences between fast reed motion and loose-reed motion.                          | 05 |
| 2(c) | What materials are used for making narrow fabrics?  | 05 |
| 2(d) | Write the features and mechanism of needle loom.  | 10 |
| 3(a) | State salient features of modern loom   | 10 |
| 3(b) | Discuss the stages involved to treat the air for air-jet weaving.                                   | 10 |
| 3(c) | What are the advantages and disadvantages of single and double rapier weft insertion system?        | 10 |
| 3(d) | Differentiate between Dewas and Gabler system.  | 05 |
| 4(a) | What do you mean by organogram? Briefly describe an organogram of a weaving factory with flowchart. | 15 |
| 4(b) | Describe about the present practice of the size problem of collar and cuff and their solution.      | 15 |
| 4(c) | Define open width machine.  | 05 |

**SECTION-B**

- |      |   |    |
|------|---|----|
| 5(a) | What are the differences between welt & selvedge? | 05 |
|------|---|----|

5(b) Calculate the fashioning frequencies of following fabric:

15

Fig: 5(b)

5(c) Define the following terms:

15

- (i) Peg
- (ii) Jack
- (iii) Selector
- (iv) Pin
- (v) Electrical Jacquard.

6(a) Draw and describe a positive feeding system device.

12

6(b) Describe the factors on which the productivity of knitted fabric depends.

10

6(c) How can you control the stitch length of a weft knitted fabric?

08

6(d) What is meant by fleece sinker?

05

7(a) What are the differences between half feeder and full feeder Lycra Single Jersey fabric?

07

7(b) How can you determine the Lycra % of a fabric?

13

7(c) Describe the Lycra fabric faults and their remedies.

15

8(a) Briefly discuss the mechanism of VDQ pulley.

08

8(b) Suppose you have got a fabric from G-Star buying house. The fabric contains following repeat White 30 course, Black 50 course and Red 10 course. Find out minimum diameter of that fabric.

15

8(c) What are the effects of busting strength on CPI & WPI of the weft knitted fabric?

12

-----THE END-----

**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

B. Sc. Engineering 4th Year 1st Term Examination, 2018

**TE 4101**

(Yarn Manufacturing Engineering-III)

Time: 3 Hours

Total Marks: 210

- N.B.:** i) Answer any THREE questions from each section in separate scripts.  
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**SECTION-A**

- 1(a) Define mixing and blending. What parameters are to be considered for mixing of fiber? 08  
1(b) A modern cotton spinning mill is going to spin 30<sup>s</sup> (K) cotton yarn. What process parameters are to be considered for producing 30<sup>s</sup> (K) yarn from Blow-room to ring frame. 27  
2(a) Make a spin plan for average yarn count 30<sup>s</sup> Ne (K) and no. of spindles 25000 from blow room to ring frame. 30  
2(b) Write short note on: ring waste. 05  
3(a) From the following particulars; find out the (i) Average yarn count (ii) Average Production/ Spindle in g (iii) When average count is 40<sup>s</sup> then find out total production. 18

Count	Working no. of spindles	Production (kg)
80 <sup>s</sup>	4400	123.20
60 <sup>s</sup>	6600	283.80
44 <sup>s</sup>	10500	650.00
30 <sup>s</sup>	4000	360.00

- 3(b) Describe the recent development of ring frame. 12  
3(c) What is Count Data system? 05  
4(a) Mention the wastage % of different sections of cotton spinning mill. 10  
4(b) Write down the types of hooked with % are found in card sliver. 08  
4(c) For producing 10000 kg combed yarn in a modern cotton spinning mill. How amount of fibers are to be taken for this purpose? 07  
4(d) Why same draft and doubling is given on the draw-frame sliver? Explain. 10

**SECTION-B**

- 5(a) Describe a modern drafting system used in draw frame. 10  
5(b) State the recent developments and faults of a draw frame. 12  
5(c) Discuss the roller settings involved in a draw frame? What is roller slip? 05  
5(d) Briefly explain the auto leveling system of draw frame. 08  
6(a) List the different types of Jute yarn. 05  
6(b) Explain the modernization of the following Jute machines: (i) Jute draw-frame and (ii) Jute spinning frame. 30  
7(a) Describe the types of wastages are found in Jute spinning mill with their uses. 18  
7(b) State the moderization of Jute batching section. 17  
8(a) List the machines are used for producing yarn from Jute waste. 05  
8(b) Describe the following m/cs with neat sketch:- (i) Teaser Card (ii) Dust shaker fraser 25  
8(c) Find out the no. of Jute spinning frame required to produce 15000 Kg/day of Jute hessian warp yarn of 8 lb/spynidle where efficiency of it is = 80% (assume all necessary parameters). 05

-----THE END-----



**KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY**

**Department of Textile Engineering**

B. Sc. Engineering 4th Year 1st Term Examination, 2018

**TE 4109**

(Fabric Structure and Design-II)

Time: 3 Hours

Total Marks: 210

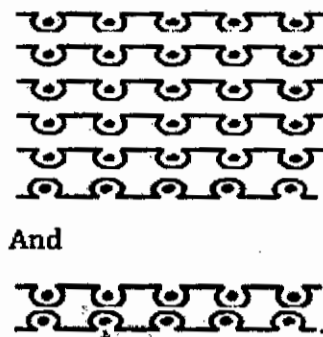
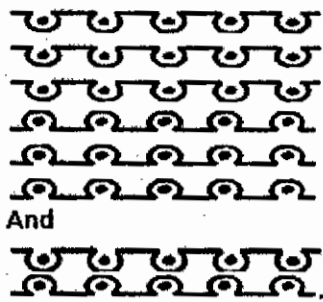
- N.B.:** i) Answer any THREE questions from each section in separate scripts  
ii) Figures in the right margin indicate full marks.  
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**SECTION-A**

- 1(a) Classify simple order of colouring and compound order of colouring with pattern chart for colour and weave effects. 15
- 1(b) Draw the weave plan of crows foot design having weave type matt and order of colour 4:4. 10
- 1(c) Show the stepped twill pattern where weave type is twill and order of color 2:1. 10
- 2(a) Compare between extra warp and extra weft thread figured design. 10
- 2(b) Describe the method of surplus figuring threads. 05
- 2(c) Draw the weave plan of extra weft figured design with drafting and lifting plan where basic weave design's repeat is 8X10. 20
- 3(a) How would you select suitable stitching positions of double cloth fabrics? 10
- 3(b) Draw the warp wadded double cloth design having face weave twill, back weave multiple twill and stitching from back to face. 15
- 3(c) Use the "face to back" stitching method to draw the weave plan of a double cloth where face and back weave both are twill. 10
- 4(a) Write the basic concept of feeder stripe, auto stripe and multi-feeder machine. 15
- 4(b) Design a pattern arrangement by using the 4 color finger box from the following colors: 20  
Red-10 course, Yellow-10 course, Blue-10 course, Pink-10 course, Violet-10 course, Magenta- 10 course, Black-10 course and Orange-80 course.

**SECTION-B**

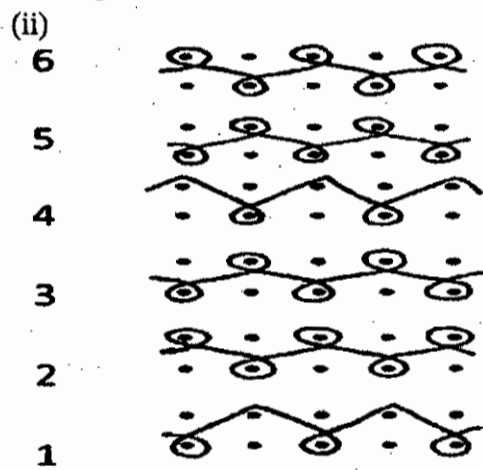
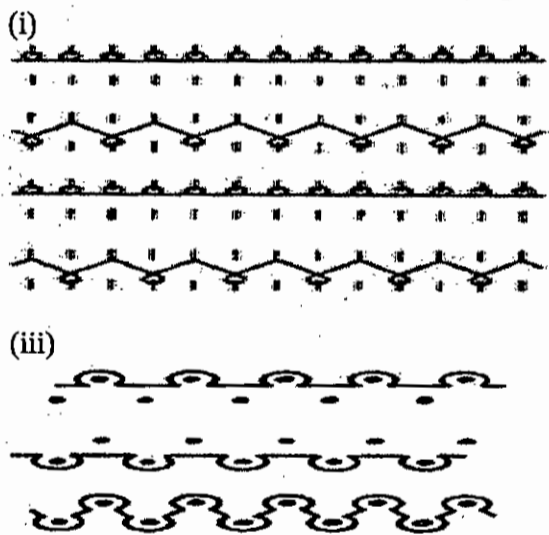
- 5(a) What are the properties of held loop? 05
- 5(b) Draw the notation diagram & needle arrangements of following design: 15
- a) b)
- c)
- 5(c) What are the effect of stitch length on fabric diameters by changing of design both weft knitted and warp knitted structure? Explain with examples. 15
- 6(a) Explain the term: "No. of truck = Maximum types of wales" with three examples. 10
- 6(b) Find out total no. of knit cam, miss cam & tuck cam of following design by systematic process: (Assume m/c dia will be 27 D):- 15
- 6(c) Make a difference between following design: 10
- (i) (ii)



7(a) Find out the run in ration, link arrangements and link height if standard link dia 2 cm. 15  
 (i) (ii)  
 and and

7(b) Compare elastic properties between four basic structures of fabric with examples. 10  
 7(c) Briefly discuss the concept of Jacquard design. 10

8(a) Draw the carriage system of following figure in flat knitting m/c: 12



8(b) Find out total no. of needles, total no. of feeder, total no. of miss cam, total no. of tuck cam & total no. of knit cam of following design (assuming dia. will be 29 Ø). 15

8(c) Find out the minimum dia. of following design: 08

-----THE END-----