

BT-4/M-26

44198

YARN MANUFACTURING-II

Paper-PCC-TEX-204-A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *five* questions in all, selecting *one* question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

**Compulsory Question****1. Attempt all parts :**

(a) Roller settings in drafting zone is primarily depends on :

- |                      |                   |
|----------------------|-------------------|
| (i) Fibre fineness   | (ii) Fibre length |
| (iii) Fibre strength | (iv) Yarn number  |

(b) For the reverse feeding, the sequence of operations in a combing cycle will be

- (i) Detaching - combing - feeding
- (ii) Feeding - detaching - combing
- (iii) Combing - feeding - detaching
- (iv) Feeding - combing - detaching

(c) Comber waste depends on :

- |                     |                          |
|---------------------|--------------------------|
| (i) Fibre fineness  | (ii) Fibre cross-section |
| (iii) Short fibre % | (iv) Fibre length.       |

- (d) The spindle top inserts are used in roving frames to introduce
- (i) Real twist in the roving
  - (ii) Real draft in the roving
  - (iii) False twist in the roving
  - (iv) False draft in the roving
- (e) Typical roving count is :
- (i) 0.5 to 3s Ne
  - (ii) 0.05 to 0.1s Ne
  - (iii) 5-10s Ne
  - (iv) 20-50s Ne
- (f) The speed of the bobbin rail in roving frame
- (i) Keeps on increasing as the bobbin builds up
  - (ii) Keeps on decreasing as the bobbin builds up
  - (iii) Does not change at all
  - (iv) Remains constant for first few layers and decreases after that
- (g) The zone where the yarn is weakest in the spinning zone is
- (i) The zone between ring and the bobbin
  - (ii) The zone between the lappet and ring
  - (iii) The zone between the delivery drafting roller and the lappet
  - (iv) Yarn already wound on the bobbin
- (h) The most critical aspect in ring spinning which limits the spindle speed is
- (i) The drafting system
  - (ii) The overhead cleaning system
  - (iii) The builder mechanism
  - (iv) The ring and traveler system

- (i) Traveller weight increase leads to :
- (i) Less tension                      (ii) More tension
  - (iii) No change                      (iv) Less twist
- (j) Balloon control rings are used to :
- (i) Increase twist                      (ii) Reduce balloon size
  - (iii) Increase speed                      (iv) Reduce draft
- (k) What is the other name of the speed frame ?
- (i) Simplex                      (ii) Roving frame
  - (iii) Flyer Frame                      (iv) All of the above
- (l) Which instrument is measure for the hardness of the cots?
- (i) Vicor                      (ii) Thow
  - (iii) Shore                      (iv) Pascal
- (m) What is the measure impurities of the comber eliminate?
- (i) Short fiber                      (ii) Noil
  - (iii) Noil + Short Fiber                      (iv) Hooks
- (n) The builder mechanism in a conventional roving frame has cone drums with hyperbolic surfaces. The belt shift
- (i) Is equal for every layer formation
  - (ii) Increases for every layer formation
  - (iii) Decreases for every layer formation
  - (iv) Depends upon the position of winding
- (o) The combing process
- (i) Deteriorates the fibre parallelization in the sliver
  - (ii) Deteriorates the fibre cleanliness in the sliver
  - (iii) Deteriorates mass uniformity in the sliver
  - (iv) None of the above
- (1×15=15)

## UNIT-I

2. (a) Discuss in details slivers Lap machine and ribbon Lap machine ? (6)  
(b) What are different types of comber and comber objective, principle and its yarn application? (9)
3. Write down the combing rectilinear cotton comber with neat and clean diagram and its details. (15)

## UNIT-II

4. What is the objective and working principle of the speed frame? Discuss in detail with neat and clean diagram. (15)
5. (a) Write down the different type of building motion of the speed frame in details. (8)  
(b) What is the common defect in the roving packages and their remedies? (7)

## UNIT-III

6. Write down the objective, principle and mechanism of twisting, winding and doffing of the ring frame. (15)
7. Write a short note of the drafting system, balloon control rings, design and type of ring and traveller and ordinary and high draft system of the ring frame. (15)

## UNIT-IV

8. Write down the objective, principle of the TFO machine and its yarn application. (15)
9. What are the doubling and objective of ring doublers and requirement of the feed package and yarn application or defects and their remedies? (15)

Roll No. ....

Total Pages : 3

BT-4/M-26

**44199**

FABRIC MANUFACTURING-II

Paper-PCC-TEX-206A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting *one* from each unit.  
Q No.1 is compulsory. All questions carry equal marks.

### Compulsory Question

1. (a) Automatic looms mainly reduce :
  - (i) Labour requirement
  - (ii) Yarn strength
  - (iii) Fabric weight
  - (iv) Warp tension
- (b) Which mechanism automatically replaces an empty pirn in the shuttle?
  - (i) Shuttle changing mechanism
  - (ii) Pirm changing mechanism
  - (iii) Bobbin loader
  - (iv) Weft feeler
- (c) Mechanical weft feeler is used to detect:
  - (i) Pirm diameter
  - (ii) Warp tension
  - (iii) Remaining weft yarn
  - (iv) Fabric width
- (d) Dobby shedding mechanism is mainly used for weaving:
  - (i) Simple weaves
  - (ii) Medium complex designs
  - (iii) Very large designs
  - (iv) Plain fabric only

- (e) Jacquard shedding mechanism is suitable for :
- (i) Simple fabrics                      (ii) Large figured designs
  - (iii) Plain weave only                (iv) Narrow fabrics
- (f) In Jacquard machines, punched cards control:
- (i) Warp tension                      (ii) Warp lifting
  - (iii) Weft insertion                (iv) Fabric winding
- (g) The device used to connect the harness cords to hooks is called :
- (i) Reed                                  (ii) Harness tie
  - (iii) Shuttle                          (iv) Feeler
- (h) What is the function of a weft feeler?
- (i) What is a pirn?
- (j) Define dobby shedding,
- (k) What is Jacquard shedding?
- (l) What is harness building in Jacquard weaving?
- (m) What is card cutting in Jacquard machines?
- (n) Define loom efficiency.
- (o) State the advantages of dobby over tappet shedding.
- (15×1=15)

### UNIT-I

2. Describe the construction and working of electrical let-off motion in modern looms. Also explain how warp tension variation affects fabric quality. 15
3. Compare take-up motion and let-off motion in weaving machines. Discuss their functions, mechanisms, and importance in controlling fabric parameters. 15

## UNIT-II

4. Explain the objectives and classification of auxiliary motions in weaving machines. Discuss their importance in improving loom efficiency and fabric quality. Briefly discuss the construction and working of loose reed motion. 15
5. Describe the working principle of weft stop motion. Explain side weft fork motion and centre weft fork motion with diagrams. 15

## UNIT-III

6. Discuss the mechanisms used in automatic looms for weft supply and replacement. Explain pirn changing mechanism. 15
7. Explain the construction and working of double lift double jack dobby shedding mechanisms. Also draw a pattern chain for 2/1 1/2 1/1 twill weave. 15

## UNIT-IV

8. Explain the construction and working of a double lift double cylinder Jacquard shedding mechanism. Describe the principal parts of a Jacquard machine and explain the types of sheds formed in Jacquard shedding with neat diagrams. 15
9. Calculate the production of a loom in meters/8 hour and kg/8 hours with following data:  
Loom width: 160 cm; Loom rpm : 220; EPI = PPI = 60;  
Warp Tex = Weft Tex = 30; width & length contraction = 6%; Efficiency = 80% 15

BT-4/M-26

44200

TEXTILE CHEMICAL PROCESSING-II

Paper-PCC-TEX-208A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Question No. 1 is compulsory and attempt *five* questions in all selecting at least *one* question from each unit. All questions carry equal marks.

**Compulsory Question**

1. (a) ..... printing is non-contact type of printing :
- (i) Roller printing                      (ii) Ink-jet printing
  - (iii) Screen printing
- (b) Sublimation printing is suitable for ..... fibers.
- (i) Only natural                      (ii) Only synthetic
  - (iii) Both
- (c) Which thickener is most suitable for cotton fabric printing using reactive dyes?
- (i) Sodium alginate                      (ii) Starch based
  - (iii) Gum
- (d) Batik is ..... style of printing.
- (i) Direct                      (ii) Resist
  - (iii) Discharge
- (e) Continuous pretreatment of cotton fabric is usually done with :
- (i) Acetic acid                      (ii) Sodium hydroxide
  - (iii) Hydrogen peroxide

- (f) Continuous dyeing of polyester fabric is done with ..... process.
- (i) Pad-dry-cure
  - (ii) Pad-steam
  - (iii) Pad-batch
- (g) Resins are mainly used for the ..... finish of cotton fabric?
- (i) Softening
  - (ii) Anti-crease
  - (iii) Flame-retardant
- (h) Zero-zero finish is synonym to :
- (i) Sanforizing
  - (ii) Milling
  - (iii) Heat setting
- (i) LOI value is related to which finish evaluation :
- (i) Water repellent
  - (ii) Flame retardant
  - (iii) Sueding
- (j) Colour fastness to Light is evaluated using.....
- (i) Gray scale
  - (ii) Blue wool scale
  - (iii) Tegewa scale
- (k) Which finishing is done for dimensional stability in synthetics?
- (i) Milling
  - (ii) Heat setting
  - (iii) Sanforizing
- (l) Peaching is the finishing process to :
- (i) Impart fabric luster
  - (ii) Provide a soft surface
  - (iii) Increase fabric strength
- (m) Milling of wool is associated with .....
- (i) Anti-shrinkage
  - (ii) Softening
  - (iii) Bulkiness

- (n) Silicones are used to impart ..... finishing effect :
- (i) Water repellent                      (ii) Flame retardant
- (iii) Scroop
- (o) Enzyme used for the bio-polishing of cotton textiles?
- (i) Cellulase                                  (ii) Amylase
- (iii) Pectinase                                  (15×1=15)

### UNIT-I

2. (a) What are the different methods of printing? Explain the Rotary screen printing with all technical details and a neat and clean machine diagram.
- (b) Enlist the different ingredients used in printing paste for textiles and give details on their functions. (10+5=15)
3. (a) Write a technical note on the concept of pigment printing of textiles with process and chemicals involved.
- (b) Discuss the transfer printing process, mentioning its advantages and disadvantages. (8+7=15)

### UNIT-II

4. (a) Give classification of textiles finishes in detail with suitable examples. Explain the concept of sanforizing with a machine diagram and technical details.
- (b) Discuss the concept of foam finishing with technical and machine details. (10+5=15)
5. Why cotton textiles show creasing? Discuss the mechanism for antcrease finish and explain the concept of formaldehyde and non-formaldehyde based antcrease finishing. Also explain the different methods to evaluate the anti-creasing finish. (15)

### UNIT-III

6. Explain the concept of the continuous pretreatment of textile with complete recipe details and machine diagrams. (15)
7. (a) Explain the different processes for continuous reactive dyeing  
(b) Explain the concept of Mass coloration technique  
(8+7 =15)

### UNIT-IV

8. What do you understand by colorfastness in textiles? Explain different types of fastness properties evaluated on textiles. Write complete details on the standard procedure for wash fastness evaluation with rating scales. (15)
  9. (a) Write details on the application of enzymes in textile chemical processing.  
(b) Give details on the effluent generated from different processes of textile chemical processing and also give brief on the effluent treatment plant. (7+8 =15)
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BT-4/M-26

44216

## ENTREPRENEURIAL AND INDUSTRIAL ENGINEERING

Paper-HSMC-TEX-216A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Examiner will set nine questions in total. Question No 1 having objective type questions will be compulsory covering all the units. The remaining eight questions of 15 marks each will be set by taking two questions from each unit. The students will have to attempt *five* questions in total, first being compulsory and selecting one from each Unit.

**Compulsory Question**

1. Attempt all questions :

- What is meant by Entrepreneurial decision making?
- Define Feasibility Study in the context of a business plan.
- State any two sources of new venture financing.
- What is meant by MSME?
- Define COB (Carry on Business) License.
- What is meant by Industrial Hazards?
- Define Method Study.
- What is meant by Micro-motion Study?

- (i) Define Inventory Control.
- (j) What is meant by Merit Rating? (1.5×10=15)

### **UNIT-I**

**(Attempt any one)**

2. Explain the entrepreneurial decision-making process. Discuss the major entrepreneurial skills required for successful entrepreneurs. (15)
3. Discuss the importance of business opportunity identification and explain the steps involved in identifying a profitable business opportunity. (15)

### **UNIT-II**

**(Attempt any one)**

4. Explain the role of MSME and Small Scale Industries in the economic development of a country. (15)
5. Discuss the importance of environmental clearance and safety regulations in industrial establishments. Explain different types of industrial hazards and their prevention. (15)

### **UNIT-III**

**(Attempt any one)**

6. Discuss the different types of production systems such as job production, batch production and mass production with suitable examples. (15)
7. Explain the concept of Ergonomics. Discuss its importance in improving productivity and worker efficiency. (15)

#### **UNIT-IV**

**(Attempt any one)**

8. Discuss the various factors affecting facility location and explain how organizations evaluate alternative locations. (15)
  9. Explain the concepts of job evaluation, wage administration and incentive schemes in industrial organizations. (15)
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Roll No. ....

Total Pages : 07

**BT-6/M-26**

**46231**

**TEXTILE TESTING-II**

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting *one* question from each Section. Q. No. 1 is compulsory. All questions carry equal marks.

**(Compulsory Question)**

1. (i) If the yarn count increases (finer yarn), the cover factor will :
- (a) Increase
  - (b) Remain constant
  - (c) Decrease
  - (d) Become zero
- (ii) In a crease recovery tester, a higher angle indicates :
- (a) Poor recovery
  - (b) Better crease recovery
  - (c) Lower stiffness
  - (d) Greater fabric weight

- (iii) Which of the following is not a type of abrasion ?
- (a) Flex abrasion
  - (b) Edge abrasion
  - (c) Core abrasion
  - (d) Flat abrasion
- (iv) What is the standard instrument used to assess fabric pilling ?
- (a) Martindale abrasion tester
  - (b) Crockmeter
  - (c) ICI pilling box
  - (d) Launderometer
- (v) The standard instrument for measuring DRAPE is :
- (a) Kawabata FB3
  - (b) Handle-O-Meter
  - (c) Cusick drape meter
  - (d) Shirley crease recovery tester
- (vi) Tearing strength indicates a fabric's ability to :
- (a) Resist a sudden impact
  - (b) Absorb water
  - (c) Resist the force required to continue a tear
  - (d) Resist repeated washing
- (vii) The bursting strength of knitted fabric is usually tested using :
- (a) Universal testing machine
  - (b) Air permeability tester
  - (c) Hydraulic bursting strength tester
  - (d) Pilling tester

- (viii) Which property most influences perceived softness of a fabric ?
- (a) Tensile strength
  - (b) Thickness
  - (c) Surface smoothness
  - (d) Color
- (ix) Fabric compression measures :
- (a) Resistance to tearing
  - (b) Resistance to surface friction
  - (c) Resistance to thickness reduction under pressure
  - (d) Air permeability
- (x) Which test is commonly used to check the quality of a zipper ?
- (a) Pilling test
  - (b) Reciprocation test
  - (c) Martindale test
  - (d) Stretch recovery test
- (xi) Which factor is most critical for the performance of a sewing thread ?
- (a) Color
  - (b) Thickness
  - (c) Tenacity
  - (d) Fibre type

- (xii) KES is primarily used for evaluating :
- (a) Color fastness
  - (b) Mechanical properties of fabrics
  - (c) Dyeing efficiency
  - (d) Yarn strength
- (xiii) Which of the following is not a FAST test ?
- (a) Bending length
  - (b) Compression
  - (c) Fabric weight
  - (d) Air permeability
- (xiv) JIS stands for :
- (a) Japanese Industry Solutions
  - (b) Japanese International Standards
  - (c) Joint International Specification
  - (d) Japanese Industrial Standards
- (xv) USTER statistics are primarily used in which stage of garment production ?
- (a) Cutting
  - (b) Sewing
  - (c) Fabric finishing
  - (d) Yarn and fabric quality control
- 15×1=15**

### Section A

2. (i) Define crimp. Discuss any *one* instrument to measure crimp percentage. What is its significance ?  
7
- (ii) Define cover factor. Explain its importance in determining fabric properties. Derive the formula for calculating cover factor using yarn count and thread density.  
8
3. (i) Define crease and crease recovery. Explain the principle and working of Shirley crease tester. 7
- (ii) Define abrasion resistance. Why is it an important property in fabric performance and end use ? Describe the Martindale abrasion tester method in detail.  
8

### Section B

4. (i) Differentiate between the tensile, tearing and bursting strength of a fabric. Compare strip and grab methods of testing tensile strength in fabrics. 8
- (ii) Explain the principle and working of any *one* instrument used to measure fabric bursting strength.  
7

5. (i) Define the terms Bending length, Flexural Rigidity and Bending Modulus. How do these properties relate to fabric handle ? 8
- (ii) Define fabric drape. Explain, how drape coefficient is calculated. 7

### Section C

6. (i) Define thermal comfort. Explain the terms used to express thermal comfort. 7
  - (ii) How can sensorial comfort be assessed ? Discuss in detail using a suitable testing method. 8
- 
7. (i) List the parameters considered during evaluation of a fabric through KES. How are these used to find primary hand value ? 10
  - (ii) Differentiate between moisture transport and moisture absorption. 5

### Section D

8. (i) What are the standard tests conducted on zippers and why are they necessary ? 5
- (ii) Describe the button pull test and its importance in garment manufacturing. 5

- (iii) What tests are used to evaluate the strength and quality of sewing threads ? **5**

**9. Explain the following :  $3 \times 5 = 15$**

- (i) Quality control and its importance in garment testing.
- (ii) Reproducibility and repeatability concept in context of quality.
- (iii) Any three common AATCC test methods used in garment testing and their significance.



BT-6/M-26

46232

## GARMENT TECHNOLOGY

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting at least *one* question from each Section.

**(Compulsory Question)**

1. (i) Which process involves arranging pattern pieces on fabric for minimum wastage ?
- (a) Drafting
  - (b) Marker Planning
  - (c) Stitching
  - (d) Finishing
- (ii) Which machine is commonly used for joining garment parts ?
- (a) Lockstitch machine
  - (b) Boiler
  - (c) Pressing table
  - (d) Dyeing machine

(iii) The cutting tool mostly used in garment factories is :

- (a) Hammer
- (b) Straight knife
- (c) Screwdriver
- (d) Drill

(iv) The purpose of grading in garment production is to :

- (a) Change fabric color
- (b) Create different garment sizes
- (c) Stitch garments
- (d) Pack garments

(v) Marker efficiency mainly affects :

- (a) Fabric consumption
- (b) Sewing speed
- (c) Worker salary
- (d) Dyeing quality

(vi) Which type of sewing needle is best suited for sewing knit fabrics ?

- (a) Ballpoint needle

- (b) Jean's needle
- (c) Universal needle
- (d) Quilting needle

(vii) Fusing process is used to attach :

- (a) Lining
- (b) Interlining
- (c) Thread
- (d) Label

(viii) Which stitch is formed by one needle thread and one bobbin thread ?

- (a) Chain stitch
- (b) Lockstitch
- (c) Overlock stitch
- (d) Zigzag stitch

(ix) The feed mechanism in a sewing machine is used to :

- (a) Cut fabric
- (b) Move fabric forward during stitching
- (c) Press garments
- (d) Dye fabric

(x) The most commonly used feed mechanism in domestic sewing machine is :

- (a) Needle feed
- (b) Walking foot feed
- (c) Drop feed
- (d) Differential feed

(xi) Which trim is used to open and close garments easily ?

- (a) Lace
- (b) Button
- (c) Zipper
- (d) Ribbon

(xii) Care labels in garments mainly provide information about :

- (a) Price
- (b) Washing and maintenance instructions
- (c) Fabric design
- (d) Sewing machine type

(xiii) Which seam type overlaps one fabric over another ?

- (a) Plain seam
- (b) Lapped seam

(c) Bound seam

(d) Welt seam

(xix) What are the three main elements required in fusing process ?

(a) Heat, pressure, time

(b) Heat, colour, detergent

(c) Pressure, glue, thread

(d) Stitch length, fabric grain, temperature

(xx) Which of the following is *not* a pressing tool ?

(a) Steam Iron

(b) Buck press

(c) Seam roller

(d) Spinning wheel

15×1=15

### Section A

2. (i) Describe the roles and responsibilities of the various departments within the garment manufacturing industry. 10

(ii) Create an organizational chart for a medium-sized garment industry. 5

3. (i) Explain the process of production in garment export house with the help of a flow chart. 10
- (ii) How do fabric properties impact garment production ? 5

### Section B

4. (i) Define fabric spreading. Explain its objectives and importance in garment production. 5
- (ii) Differentiate between normal marker planning and computerized marker planning with respect to efficiency, accuracy and cost. 5
- (iii) Describe different types of lay plans used in cutting rooms. 5
5. (i) What is pattern making ? Explain different techniques of pattern making. 5
- (ii) Define marker planning. How to calculate marker efficiency ? Why is marker planning important in garment industry. 5
- (iii) Why must patterns be prepared accurately before spreading and cutting ? 5

### Section C

6. (i) Define Seam. With the help of neat diagrams discuss different types of seams, their properties and applications. 8
- (ii) Explain the types of cutting equipment used in garment manufacturing. 7
7. Write short notes on the following :
- (i) Sewing needles 5
- (ii) Stitch classes 5
- (iii) Types of feed mechanisms. 5

### Section D

8. (i) What are the different types of trimmings used in garments ? Discuss their functions and how they affect the functionality of the garments ? 10
- (ii) Differentiate between trims and accessories. Give suitable examples. 5
9. (i) What is fusible interlining ? write the advantages of fusing in garment production. 5

- (ii) What is care labelling ? Explain the importance of care labels in garments. 5
- (iii) Explain the purpose and importance of pressing in garments? What is the role of heat, steam and pressure in the pressing process ? 5



Roll No. ....

Total Pages : 05

**BT-6/M-26**

**46233**

**KNITTING TECHNOLOGY**

Time : Three Hours]

[Maximum Marks : 75

Instruction : Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory. All questions carry equal marks.

- (a) Gauge of circular knitting machine is defined as :
- (i) No. of needles in 1 diametric inch
  - (ii) No. of needles in 1 circumferential inch
  - (iii) No. of needles in 2 diametric inch
  - (iv) No. of needles in 2 circumferential inch
- (b) Ponte-Di-Roma is a derivative of :
- (i) Single Jersey                      (ii) Rib
  - (iii) Interlock                        (iv) None of these
- (c) Sinkers are used in :
- (i) Single jersey machine
  - (ii) Circular rib knitting machine
  - (iii) V-bed flat knitting machine
  - (iv) Interlock knitting machine

- (d) A row of loops produced by adjacent needles in knitting cycle is called :
- (i) Course
  - (ii) Wale
  - (iii) Gauge
  - (iv) None of these
- (e) A tuck stitch makes the fabric :
- (i) Wider, thicker and more porous
  - (ii) Narrow, thicker and more porous
  - (iii) Narrow, thinner and less porous
  - (iv) Narrow, thicker and less porous
- (f) Relaxed  $1 \times 1$  rib with equivalent to single jersey :
- (i) Twice thicker and same wider
  - (ii) Same thicker and same wider
  - (iii) Same thicker and half wider
  - (iv) Twice thicker and half wider
- (g) A rigid presser bar is essential with :
- (i) Latch needle
  - (ii) Bearded needle
  - (iii) Compound needle
  - (iv) None of above

When a stitch failing to form because of malfunctioning of needle, it is called :

- (i) Dropped stitch      (ii) Overlap
- (iii) Tuck stitch      (iv) Loop

(i) A knit jersey with all needle loops on one side of the fabric is called :

- (i) Single jersey      (ii) Double jersey
- (iii) Fleece      (iv) French jersey

(j) A double end needle is essential for the production of :

- (i) Rib      (ii) Purl
- (iii) Interlock      (iv) Single jersey

(k) Draw a typical sinker used in raschel knitting machine and state its function.

(l) Define the term 'Pitch'.

(m) Draw the point paper notation of 'eightlock' weft knitted structure.

(n) Define the terms 'course density' and 'wale density'.

(o) Calculate the yarn count required for 12 gauge single jersey machine.

$$15 \times 1 = 15$$

### **Unit I**

2. Explain the concept of knitting. Describe the principles of weft knitting and warp knitting and discuss the major differences between woven and knitted fabrics. **15**
3. Describe different types of knitting needles used in knitting machines. Explain the construction and working of spring beard needle, latch needle, and compound needle, along with the knitting cycle of a latch needle. **15**

### **Unit II**

4. Discuss the basic principles and elements of flat knitting machines. Also explain the different types of flat knitting machines, highlighting the differences between mechanical and computerized knitting machines. **15**
5. Explain the structure and symbolic representation of weft knit structures. Discuss the characteristics and properties of plain, rib, interlock and purl knit structures with suitable diagrams. **15**

### **Unit III**

6. Discuss the common faults in knitted fabrics. Explain their causes and remedies and describe the role of dimensional parameters such as stitch length, WPI, CPI, stitch density, GSM, tightness factor and spirality in knitted fabric quality. **15**

7. Describe the construction and working of warp knitting machines. Explain the functions of needle bar, sinker bar, guide bar, pattern wheel, and chain link, and discuss the knitting cycle of warp knitting including open lap and closed lap stitches. Also compare Raschel and Tricot knitting machines. 15

#### Unit IV

8. Explain two-bar warp knit structures. Describe the construction, characteristics, and applications of Full Tricot, Locknit, Reverse Locknit, and Satin structures. 15
9. Discuss the applications of weft and warp knitted fabrics in Technical Textiles. Also explain the working principle and advantages of seamless knitting technology. 15



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46234

## THEORY OF TEXTILE STRUCTURE

Time : Three Hours]

[Maximum Marks : 75

**Note :** Attempt *Five* questions in all, selecting *one* question from each Section. Q. No. 1 of Section A is compulsory.

**Section A**

1. Attempt all sub questions of this Section :  $15 \times 1 = 15$

(i) The most model value for yarn in fabric form is :

- (a) 0.55                      b) 0.65  
(c) 0.75                      (d) 0.85

(ii) Retraction factor lies in the range :

- (a) 0-1  
(b) 1-10  
(c) 1- $\infty$   
(d) No range but a fixed value.

(iii) Ideal packing means :

- (a) Random fibre arrangement  
(b) Maximum fibre density  
(c) Minimum fibre density  
(d) Loose structure

- (iv) Specific volume is :
- (a) Mass per unit volume
  - (b) Volume per unit mass
  - (c) Length per mass
  - (d) Diameter per length
- (v) Higher packing density means :
- (a) Lower porosity      (b) Higher porosity
  - (c) No porosity      (d) Variable porosity
- (vi) A yarn diameter reduces from 0.3 mm to 0.2 mm. % reduction is :
- (a) 25%      (b) 30%
  - (c) 33%      (d) 50%
- (vii) Flexible thread model assumes :
- (a) Rigid yarns
  - (b) No bending
  - (c) Yarns can bend freely
  - (d) No deformation
- (viii) Yarn spacing in a fabric with 20 EPC is :
- (a) 0.02 cm      (b) 0.05 cm
  - (c) 0.1 cm      (d) 0.2 cm
- (ix) If warp cover = 0.75 and weft cover = 0.65, total cover (Peirce approx.) is equal to :
- (a) 0.81      (b) 0.91
  - (c) 1.01      (d) 1.11

(x) Migration Index for uniform distribution of fibres is :

- (a)  $\pm 0\%$                       (b)  $\pm 25\%$   
(c)  $\pm 50\%$                       (d)  $\pm 100\%$

(xi) A tapering broken end indicates :

- (a) good resistance to fibre slippage  
(b) poor resistance to fibre slippage  
(c) moderate resistance to fibre slippage  
(d) almost 100% fibre slippage

(xii) Yarn Balance for a fabric having 20s Ne warp and 30 Tex weft is :

- (a) 0.60                      (b) 1.00  
(c) 1.50                      (d) 0.67

(xiii) Increasing loop length will generally :

- (a) increase fabric tightness  
(b) decrease fabric extensibility  
(c) increase fabric porosity  
(d) increase stitch density

(xiv) If loop length doubles, tightness factor will :

- (a) double                      (b) halve  
(c) remain same              (d) become zero

(xv) In Kemp's race track model, if straight length is 5 mm and radius is 1 mm, yarn length is :

- (a) 10 mm                      (b) 11.14 mm  
(c) 12.28 mm                  (d) 13.14 mm

### Section B

2. (a) Discuss the factors that determine the fibre packing in real yarns. 8
- (b) Calculate the diameter of a yarn spun of wool fibres to the linear density of 54 metric yarn at a twist factor of 110 ( $\alpha_m$ ). 7
3. (a) Show that packing coefficient for open and close packing is 0.75 and 0.91 respectively. The diagrams should be drawn accurately and neatly. 8
- (b) Derive an expression relating helix angle and twist factor. 7

### Section C

4. (a) Define Ideal fibre Migration and discuss the methodology suggested by Morton to characterize fibre migration. 8
- (b) Discuss the effect of fibre length and fibre fineness on fibre migration. 7
5. (a) Analyze the structural mechanics of continuous filament yarn to predict its stress-strain behaviour when subjected to large strain. 10
- (b) Differentiate the nature of break in low twist and high twist yarns. 5

### Section D

6. (a) Describe Ashenhurst's and Armitage Cloth Setting Theories with suitable examples. 8

- (b) Show that for a square jammed cloth the Peirce's equation is identical to Ashenhurst's Cloth setting theory. 7
7. (a) State and derive Peirce's basic equations from his geometrical model for plain woven cloth. 10
- (b) Determine  $h_1$ ,  $h_2$ ,  $\theta_1$ ,  $\theta_2$ , and D for the given values : 5
- $N_1 = 23$  Ne;  $N_2 = 29$  Ne,  $n_1 = 46$ ,  $n_2 = 60$ ,  
 $c_1 = 8.0\%$ ,  $c_2 = 6.5\%$

### Section E

8. (a) Explain geometry of weft knitted structures. 5
- (b) Discuss loop parameters. 5
- (c) Explain influence of friction on knit geometry. 5
9. (a) Discuss the concept of spirality and skewness formation. How can these be controlled ? 8
- (b) Write a detailed note on bending and buckling parameters of a fabric. 7



BT-6/M-26

46236

## STRUCTURE AND PROPERTIES OF FIBRES

: Three Hours]

[Maximum Marks : 75

: Attempt *Five* questions in all, selecting *one* question from each Unit. Q. No. 1 is compulsory.

## Unit I

## Compulsory Question

Choose the correct answer from the choices given below :

- (a) Crystallinity of fibres is measured by :
- (i) SEM
  - (ii) X-ray diffraction
  - (iii) UV spectroscopy
- (b) The main polymer present in cotton fibre is :
- (i) Protein
  - (ii) Cellulose
  - (iii) Polyester
- (c) Orientation in fibre mainly affects :
- (i) Strength
  - (ii) Colour
  - (iii) Odour
- (d) Yield point represents :
- (i) Elastic limit
  - (ii) Breaking point
  - (iii) Toughness

- (e) Creep is defined as :
  - (i) Instant failure
  - (ii) Time dependent deformation
  - (iii) Thermal expansion
- (f) Work of rupture is also called :
  - (i) Modulus
  - (ii) Toughness
  - (iii) Resilience
- (g) Moisture regain depends upon :
  - (i) Relative humidity
  - (ii) Fibre diameter
  - (iii) Twist factor
- (h) Hysteresis occurs during :
  - (i) Moisture absorption-desorption
  - (ii) Polymerization
  - (iii) Combustion
- (i) Birefringence is related to :
  - (i) Double refraction
  - (ii) Static charge
  - (iii) Thermal conductivity
- (j) Glass transition temperature ( $T_g$ ) is :
  - (i) First order transition
  - (ii) Second order transition
  - (iii) Chemical reaction
- (k) First order transition involves :
  - (i) Latent heat
  - (ii) No latent heat
  - (iii) No volume change

- (l) Viscoelastic behaviour is represented by :
- (i) Hooke's law only
  - (ii) Spring and dashpot model
  - (iii) Bernoulli's equation
- (m) PET fibre is :
- (i) Regenerated fibre
  - (ii) Synthetic fibre
  - (iii) Natural fibre
- (n) Static charge generation is related to :
- (i) Dielectric properties
  - (ii) Tensile strength
  - (iii) Moisture diffusion
- (o) Moisture diffusion in fibres follows :
- (i) Fick's law
  - (ii) Ohm's law
  - (iii) Newton's law
- 15×1=15

## Unit II

What do you understand by morphology and order in fibre structure ? Discuss concept and theories of orientation and crystallization with suitable measurement techniques such as X-ray. 15

Describe chemical and physical structure of wool, silk, cotton and bast fibres. Compare them with Nylon, PET, Acrylic and Viscose fibres. 15

### Unit III

4. Explain load-elongation curve and stress-strain curve of fibres. Discuss scientifically modulus, elasticity, viscoelasticity, work of rupture, yield point, creep and stress relaxation behaviour. 15
5. Discuss frictional properties of fibres and each methods of measurement. 15

### Unit IV

6. Explain relation between moisture regain and relative humidity. Discuss hysteresis, diffusion theories and quantitative analysis of moisture absorption in fibres. 15
7. Describe optical properties of fibres including refractive index, polarization of light and birefringence with measurement techniques. 15

### Unit V

8. Discuss molecular motion and transition phenomena in fibres. Explain first and second order transition and thermal expansion behaviour. 15
9. Explain electrical properties of fibres including dielectric behavior and static charge generation. 15



Roll No. ....

Total Pages : 4

BT-7/M-26

47331

ADVANCED CHEMICAL PROCESSING

Paper-PCC-TEX-403A

Time : Three Hours]

[Maximum Marks : 75

**Note :** Question-1 is compulsory, and attempt total *five* questions selecting at least *one* question from each of the four units. All questions carry equal marks.

**Compulsory Question**

1. (i) Cold-Pad-Batch process is associated with
- (a) Continuous dyeing
  - (b) Continuous Pre-treatment
  - (c) Softener
- (ii) Bleaching with ..... is suitable for combined pre-treatment
- (a) Sodium hypochlorite    (b) Hydrogen Peroxide
  - (c) Chlorite
- (iii) Which enzyme is used for Bio-polishing treatment of cotton fabrics
- (a) Amylase                      (b) Cellulase
  - (c) Protease
- (iv) Supercritical dyeing is also known as ..... dyeing
- (a) Contactless                  (b) Waterless
  - (c) Machine-less

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19/05

- (v) Non-contact type of printing
  - (a) Roller printing                      (b) Screen printing
  - (c) Ink-jet printing
- (vi) Direct dyes show ..... wash fastness.
  - (a) Moderate                      (b) Good
  - (c) Excellent
- (vii) Light fastness is evaluated in the range
  - (a) 1-8                      (b) 1-5
  - (c) 1-10
- (viii) Rubbing fastness is evaluated using
  - (a) Grey Scale                      (b) Blue wool standards
  - (c) Tegwa Scale
- (ix) K/S value is used to evaluate the
  - (a) Colour difference                      (b) Colour strength
  - (c) Colour fixation
- (x) Pass/Fail of two coloured samples using CCM is done with
  - (a)  $\Delta E$                       (b)  $\Delta L$
  - (c)  $\Delta a$
- (xi) DMDHEU is associated with
  - (a) Soft finish                      (b) Wrinkle resistant
  - (c) Antimicrobial
- (xii) Which CIE standard illuminant represents average daylight?
  - (a) D65                      (b) D55
  - (c) TL84

(xiii) Paper printing is associated with ..... colour mixing.

- (a) Additive                      (b) Subtractive  
(c) Combined

(xiv) HE type of reactive dyes has

- (a) High affinity                      (b) High reactivity  
(c) Both of them

(xv) Antibacterial finish associated with ..... nanoparticles.

- (a) Silver                      (b) Titanium dioxide  
(c) Zinc.                      (15×1=15)

### UNIT-I

2. What is the concept of Supercritical CO<sub>2</sub> dyeing? Discuss the process of the supercritical dyeing technique with all relevant technical information and describe the advantages and disadvantages of this technique over conventional dyeing. 15
3. Describe the digital printing technique with its types and discuss all the details on fabric preparation, process of application, and post. 15

### UNIT-II

4. What do you understand by colour fastness? Discuss in detail the methods of evaluation of washing fastness in textiles with their grading system. 15
5. (a) What are low liquor application techniques? Elaborate on their advantages and disadvantages. 8
- (b) Write the concept of zero-formaldehyde easy-care finishing with technical details. 7

### UNIT-III

6. (a) Explain the different colour mixing laws and give examples of their association. 5
- (b) What is the standard observer function? Differentiate between  $2^\circ$  and  $10^\circ$  observer. 5
- (c) Differentiate between natural and artificial sources of light. What are CIE illuminants? Explain. 5
7. (a) What is the Kubelka-Monk equation? Discuss its features and significance. 5
- (b) Write a technical note on the process of recipe prediction. 10

### UNIT-IV

8. With neat diagram explaining the construction and working of a spectrophotometer. 15
9. Write a short technical note on the following :
- (a) Munsell colour order system.
- (b) Whiteness and Yellowness Indices. (8+7=15)
-

BT-8/M-26

48346

## TECHNICAL TEXTILE-II

Paper-PCC-TEX-402A

Time Allowed : 3 Hours]

[Maximum Marks : 75

**Note** : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

### Compulsory Question

1. Answer the following questions :  $10 \times 1\frac{1}{2} = 15$

- How does SMART Bandage work?
- Why is Alginate preferred for wound care?
- List the factors driving the Health care market.
- Which material is used for Chito Gauze and why?
- Differentiate dry, damp and wet fast action sportswears.
- Define the Parachute.
- How do wind control fabric help in agrotech?
- List the requirements of the Textile fibres to be used in marine.

- (i) What are the necessary conditions for E-textiles?
- (j) How do Soft Body Armors differ from Hard Body Armors?

### UNIT-I

- 2. (a) List the key points for textile fibres to be used in artificial lung. 5
- (b) Classify sutures as per applications.
- (c) Write a note on soft-tissue implants.
- 3. Write detailed notes on the following in reference to Medical textile :
  - (a) Bandage and its classification. 5
  - (b) Textile fibres for Medical applications. 5
  - (c) Healthcare and Hygiene products. 5

### UNIT-II

- 4. (a) Describe the features of thermal protective clothing along with its performance evaluation. 10
- (b) Define different body armors with their working principles. 5
- 5. (a) Describe various barrier material systems to protect the soldiers from Chemical and Biological warfare agents. 10

- (b) What are the functional property requirements for a parachute fabric? 5

### UNIT-III

6. Outline a detailed classification of sportswear. Identify the important functional requirements for Textile used for sportswear. How are these achieved in Commercial practices? Discuss. 5,3,7
7. What is Agrotech? Describe the processes and materials involved with references to end use utilities of the Agrotech. 3,12

### UNIT-IV

8. (a) Discuss the role of Textiles in the development of awning and canopies. What type of Textile materials are used in these applications? 8
- (b) Classify ropes on the basis of Manufacturing process and areas of application and with the help of flow chart show the production of any one type of rope. 7
9. Write short notes on the following :
- (a) E-Textile. 8
- (b) Application of Technical Textiles in Nano Technology. 7

BT-8/M-26

48349

**NONWOVEN TECHNOLOGY**

Paper-PEC-TEX-412A

Time Allowed : 3 Hours]

[Maximum Marks : 75

**Note** : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

**Compulsory Question**

1. Objective type questions :

15×1=15

(i) Which of the following best defines Nonwoven fabrics?

(a) Fabrics made by weaving or knitting fibers together

(b) Fabrics made directly from fibers bonded by mechanical, thermal, or chemical means.

(c) Fabrics made exclusively from natural fibers using spinning methods.

(d) Fabrics produced only by Felting wool fibers.

(ii) Which of the following is not a Nonwoven product?

(a) Wipes (b) Tea Bags

(c) Single Jersey T shirt (d) Diapers.

48349/K/698/50

P. T. O.

- (iii) In the spunbond process, filament strength is primarily affected by :
- (a) Polymer crystallinity and quenching rate.
  - (b) Fiber moisture regain
  - (c) Blending ratio
  - (d) Web density after carding
- (iv) In wet-laid web formation, fiber dispersion stability mainly depends on :
- (a) Fiber length and Aspect ratio.
  - (b) Air velocity in the Chamber.
  - (c) Polymer extrusion temperature.
  - (d) Bonding pressure.
- (v) In needle-punching, which of the following parameters of the needle board affects the fabric density and thickness?
- (a) Needle diameter, spacing and penetration depth.
  - (b) Polymer type.
  - (c) Air temperature.
  - (d) Fiber moisture regain.
- (vi) Which factor does not significantly influence the needle-punching process?
- (a) Fiber type and length.

- (b) Needle bar speed and frequency.
  - (c) Web basis weight.
  - (d) Dyeing temperature.
- (vii) In chemical bonding of Nonwovens, the Primary function of Chemical binders is to :
- (a) Entangle fibers mechanically.
  - (b) Fuse fibers using heat.
  - (c) Form a Network that holds fibers together by adhesion.
  - (d) Increase fiber length.
- (viii) The Primary purpose of dyeing in Nonwoven wet finishing is to :
- (a) Reduce shrinkage.
  - (b) Impart colour uniformly.
  - (c) Increase tensile strength.
  - (d) Create surface smoothness.
- (ix) Which of the following is a Chemical finishing for Nonwovens that prevents accumulation of Static electricity?
- (a) Antimicrobial.
  - (b) Antistatic.
  - (c) Water repellent.
  - (d) Flame retardant.

- (x) Which chemical finishing improves absorbency of Nonwovens?
- (a) Water-repellent finishing.
  - (b) Antimicrobial finishing.
  - (c) Hydrophilic finishing.
  - (d) Flame retardant finishing.
- (xi) A barber-pole effect in needle-punched nonwovens occurs due to :
- (a) Uneven calendaring.
  - (b) Misalignment of Fiber orientation during cross-lapping.
  - (c) Excessive moisture during drying.
  - (d) Chemical finishing.
- (xii) Thickness of a nonwoven fabric is measured primarily to determine :
- (a) Fiber type.
  - (b) Bulk, compressibility and uniformity.
  - (c) Porosity.
  - (d) Tensile strength.
- (xiii) The tensile properties of Nonwovens are typically measured using :
- (a) Universal Testing Machine (UTM).

- (b) Thickness gauge.
  - (c) Porometer.
  - (d) Hydrostatic tester.
- (xiv) Water vapour permeability test in Nonwovens is important for :
- (a) Geotextiles.
  - (b) Breathable apparel and Hygiene products.
  - (c) Battery separators.
  - (d) Flame-retardant fabrics.
- (xv) Thermal conductivity and insulation tests in nonwovens are used to evaluate suitability for :
- (a) Hygiene products.
  - (b) Thermal protective clothing and insulation Materials.
  - (c) Filtration media.
  - (d) Geotextiles.

#### UNIT-I

2. (a) Discuss the role of carding in Nonwoven fabric production. Explain its principle, working, types of carding machines used, and its influence on web quality and properties. 12

- (b) Explain the objectives of cross-lappers. 3
3. Explain the air-laid process for manufacturing Nonwoven fabrics. Describe its principle, process steps, key parameters, and major applications. 15

## UNIT-II

4. (a) Discuss the principle, process and technology of hydroentanglement (spunlacing) in Nonwoven fabrics. 10
- (b) Discuss the factors affecting the quality of Spunlace nonwoven fabrics. 5
5. Discuss the factors affecting the quality of Bonded nonwoven fabrics. Explain how needle design, Web weight, Fiber type, Water pressure, thermal bonding temperature, and binder application influence the Mechanical and functional properties of Nonwovens? 15

## UNIT-III

6. (a) Discuss the working principle of Chemical finishing in Nonwoven fabrics and its effect on Fabric performance. 10
- (b) Explain antimicrobial finishes for Nonwovens, including their principle, methods of application and typical applications. 5

7. Explain the mechanisms involved in the dry finishing of nonwoven fabrics, including shrinkage, wrenching, creeping and glazing. 15

#### UNIT-IV

8. Explain five common defects observed in Nonwoven fabrics, including their causes and effects on Fabric properties. 15
9. Describe the procedures for measuring the porosity of Nonwoven fabrics and explain their significance in evaluating fabric performance. 15

BT-8/M-26

48351

**APPAREL MARKETING &  
MERCHANDISING**

Paper-PEC-TEX-416A

Time Allowed : 3 Hours]

[Maximum Marks : 75

**Note** : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. 1 is compulsory. All questions carry equal marks.

**Compulsory Question**

1. Objective type questions : 10×1½=15

(i) The main objective of marketing is to :

- (a) Maximize production.
- (b) Focus on Customer satisfaction and long-term relationships.
- (c) Minimize competition.
- (d) Increase advertisement spending.

(ii) Which of the following is not one of the 4 Ps of marketing?

- |              |                |
|--------------|----------------|
| (a) Price    | (b) Product    |
| (c) Planning | (d) Promotion. |

- (iii) Which of the following best defines fashion merchandising?
- (a) Managing textile mills.
  - (b) Planning and promoting apparel products to meet Consumer demand.
  - (c) Designing Industrial Machines.
  - (d) Managing factory payrolls.
- (iv) Market segmentation is done to :
- (a) Divide the market into homogeneous groups of Buyers.
  - (b) Increase the cost of Marketing.
  - (c) Eliminate competition.
  - (d) Reduce production expenses.
- (v) Which of the following departments is not part of a Garment export house?
- (a) Sampling department.
  - (b) Finance department.
  - (c) Cutting and Sewing department.
  - (d) Aviation department.
- (vi) A Time and Action (T&A) Plan is used to :
- (a) Schedule and monitor each stage of order execution to ensure timely delivery.

- (b) Record employee working hours.
  - (c) Track raw material costs.
  - (d) Prepare design sketches.
- (vii) The term 'penetration pricing' refers to :
- (a) Setting a high initial price for a new product.
  - (b) Setting a low initial price to gain market share quickly.
  - (c) Increasing price gradually after launch.
  - (d) Price discrimination based on market location.
- (viii) In export documentation, a Bill of Lading is issued by :
- (a) Customs authorities.
  - (b) The shipping company.
  - (c) The importer's bank.
  - (d) The Chamber of Commerce.
- (ix) Which of the following is not an Export incentive scheme in India?
- (a) RoDTEP.
  - (b) EPCG.
  - (c) CGST.
  - (d) Duty Drawback.

(x) In International trade, CIF stands for :

- (a) Cost, Insurance and Freight.
- (b) Cargo, Insurance and Forwarding.
- (c) Cost, Invoice and Freight.
- (d) Customs, Insurance and Fee.

### UNIT-I

2. Explain the importance of Marketing research in Fashion marketing. How does it help in Product planning and promotion?

*Or*

Explain the importance of Market segmentation in apparel marketing. Illustrate with examples of how brands target different Consumer groups?

15

### UNIT-II

3. Explain the workflow of a Garment export house, emphasizing coordination among sampling, production and quality departments.

*Or*

Describe the role of Quality control in the apparel production process. Why is it essential for export success?

15

### UNIT-III

4. Define Merchandising. Explain with examples how a merchandiser manages order execution from sampling to shipment.

*Or*

What is product costing? Explain various elements of costing used in apparel export pricing. 15

### UNIT-IV

5. Describe the key documents required in pre-shipment and post-shipment processes. Explain their purpose briefly.

*Or*

What are the main types of Payment methods used in Export trade? Discuss their advantages and risks for exporters. 15

Roll No. ....

Total Pages : 4

BT-8/M-26

**48354**

## **MANAGEMENT OF TEXTILE PRODUCTION**

Paper-OEC-TEX-422A

Time Allowed : 3 Hours]

[Maximum Marks : 75

**Note** : Attempt **five** questions in all, selecting **one** question from each Unit. Question No. **1** is compulsory. All questions carry equal marks.

### **Compulsory Question**

1. Write notes on the following : 10×1½=15

- (a) What is Factory act? What is its importance?
- (b) Define the terms used to express the intensity of sound.
- (c) List the major tasks of Inventory management.
- (d) Enumerate the advantages of ERP.
- (e) What is an effective layout?
- (f) Outline the objectives of WTO.
- (g) Which machine in Spinning contributes maximum cost?

- (h) Which type of maintenance schedules is better and why?
- (i) Define the terms related to lighting.
- (j) List the challenges faced by handloom sector in India.

### UNIT-I

- 2. (a) How is Energy consumption calculated in a Textile machine? What measures are adopted to reduce energy consumptions in a composite textile mill? 10
- (b) What is the concept of Zero defect? Enumerate its advantages for Textile. 5
- 3. (a) What is JIT technology? How is it useful for Textile Industry? 5
- (b) What is NTTM ? When was it set up? List its objectives. How far these objectives have been achieved? 10

### UNIT-II

- 4. (a) How do WTO/GATT/MFA play a deciding role in the growth of Global Industry Scenario? 9
- (b) Describe different types of Plant layouts along with their advantages and disadvantages in the light of Textile manufacturing processes. 6

5. (a) Outline supply chain management and its importance in reference to textile industry. What is ABC analysis? 8
- (b) How do ERP and MIS work in textile sector to improve production planning and efficiency? 7

### UNIT-III

6. (a) What is the importance of maintaining a particular humidity in a Textile department? Mention humidity levels to be maintained for different departments of a composite textile mill. 8
- (b) Explain various developments in the humidification system used in a Textile mill. 7
7. (a) Discuss Preventive and Breakdown maintenance in detail along with advantages and disadvantages. 7
- (b) Outline the maintenance schedules of a ring frame and a loom. 8

### UNIT-IV

8. (a) How do end breaks affect workload assignments on different machines? Explain with suitable examples. 6
- (b) List and define the parameters used to express the Illumination and noise levels. What is the significance of these and what measures are taken to maintain their levels in a Textile mill. 9

9. (a) What safety measures are adopted in different sections viz. spinning, weaving, processing and garment manufacturing of Textile industries? Discuss including fire safety measures. 10
- (b) How do you foresee the growth of Textile Industry in the light of Make in India Concept and startup policy of Indian Government? 5