

10/05/2019

Roll No.

Printed Pages : 3

37189

BT-7 / M-19

TECHNICAL TEXTILES-I

Paper-TT-401N

Time allowed : 3 hours]

[Maximum marks : 75

Note :- Attempt five questions in all selecting one from each section. Section-A contains only one compulsory question.

Section-A

1. (a) Name three centres of Excellence of technical textiles allotted by Ministry of Textiles, GOI along with their agencies.
- (b) What does TMTT stand for?
- (c) What is the range of woven fabric area density used for filtration?
- (d) Which particular weave produces tightest and the most rigid single layer filter and why?
- (e) Name three fibres used for Blast Proof fabrics.
- (f) What is meant by agrotech? Give few examples of its products.
- (g) What is the importance of automotive safety devices?
- (h) What are major requirements for Geotextiles?
- (i) Define Geogrid.
- (j) Enlist the properties of any one technical fibre with its use.

10×1.5 =15

37189

[Turn over

Section-B

2. (a) What are technical textiles? Discuss different types of technical textiles with their applications.
(b) Explain technological innovations supporting advancement of technical textiles. 10+5=15
3. (a) Write a detailed note on Indian Government's approach for growth of technical textiles.
(b) Classify technical textiles giving suitable examples. 8+7=15

Section-C

4. (a) Describe various types of Geosynthetics and their uses.
(b) How can the life of geotextile in soil be tested? 10+5=15
5. (a) Discuss the applications of Geotextiles.
(b) Highlight the fibre requirements for geotextiles. 10+5=15

Section-D

6. (a) Explain the filtration techniques for different media with examples.
(b) Discuss the role of fibres in improving filtration efficiency. 10+5
7. (a) Differentiate Dry and Wet filtration.
(b) Write a note on pore size and particle size in reference to filtration. 8+7=15

37189

Section-E

8. Write notes on the following:
- (i) Headliners;
 - (ii) Filters used in automotives;
 - (iii) Technical textiles in marine. 5×3=15
9. (a) How do you account for applications of textiles in automobiles? What are the respective fibre requirements?
- (b) List the types of fibres required for tyre along with properties. 10+5=15

29/05/2019

Roll No.

Total Pages : 03

BT-8/M-19

38241

TECHNICAL TEXTILES-II

TT-402N

Time : Three Hours]

[Maximum Marks : 75

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

Section A

1. Answer the following in brief :

- (a) What are artificial turf and carpet backing cloths ?
- (b) Differentiate Chitin and Chitosan. Where do we use these ?
- (c) Why sterilization and non-carcinogenicity are required in medicinal textiles ?
- (d) List the characteristics requirements for ballistic protection.
- (e) How do you define a Parachute ?
- (f) List few areas of applications for smart textiles.
- (g) What is meant by agricultural membrane ?
- (h) Differentiate hoardings and signages. $7 \times 2 + 1 = 15$

(3-110/10)L-38241

P.T.O.

Section B

2. (a) Define Sutures. Enumerate various requirements for suture materials giving suitable examples.
(b) Write a note on Extracorporeal Devices. 8+7
3. (a) What is meant by Hydrogel ? How many types of hydrogels are there ? Where are these used ?
(b) Write a note on Tissue Engineering.
(c) Define medical Drapes. Where are these used ?
List few examples. 6+5+4

Section C

4. (a) Define protective textiles. Discuss the various types and level of protection.
(b) Discuss the fibre and fabric constructional details for ballistic protection. 7+8
5. (a) Write a note on chemical and biological protective clothing.
(b) Differentiate soft body armour from hard body armour.
(c) List the characteristics of water proof breathable fabrics. 8+4+3

Section D

6. (a) What for Pathogen barrier fabrics are used ? List few examples along with fibres used in each application.
- (b) Write a detailed note on Wearable Technology for snow clothing. 8+7
7. (a) How are smart moisture management fabrics used for protection in glacier regions ?
- (b) Explain the working principle of electromagnetic validation shielding. How does textile play its role in this shielding ? 7+8

Section E

8. (a) Briefly outline the production technologies of ropes and cordages alongwith fibrous requirements.
- (b) Write a note on canvas covers and tarpaulins. 8+7
9. (a) What is the role of textile in sports surfaces ? Describe in detail.
- (b) How does textile help in finishing and animal husbandary ?
- (c) Write a note on awnings and canopies in relation to Buildtech. 5+5+5=15

13/05/2019

Roll No.

Printed Pages : 2

37205

BT-7 / M-19

ARTIFICIAL INTELLIGENCE

Paper-IT - 403 N

Time allowed : 3 hours

[Maximum marks : 75

Note :- Attempt any five questions, selecting at least one from each unit.

Unit-I

1. (a) Define production rule. Discuss various conflict strategies in AI. 7½
- (b) Discuss various applications of AI. 7½
2. (a) Explain different types of production system in detail. 7½
- (b) Differentiate Natural & Artificial Intelligence. Explain different types of problems which require AI techniques to be solved. 7½

Unit-II

3. (a) What is the significance of Wang's algorithm? Write various steps involved in Wang's algorithm. 7½
- (b) List various propositions and tautologies used for propositional logic with example. 7½
4. Illustrate the use of first order logic to represent knowledge. 15

Unit-III

5. (a) Write and explain various steps involving in implementation of back tracking using stack. 7½

37205

[Turn over

(2)

- (b) What is use of Cut & Fail Predicates in Prolog with example? 7½
6. Differentiate NML I and NML II. Explain reasoning with NML II in detail. 15

Unit-IV

7. Explain the use of planning graph in providing better heuristic estimation with suitable example. 15
8. (a) Differentiate inductive and statistical learning. 7½
- (b) Explain active and passive reinforcement learning in detail. 7½

37205

17/05/2019

Roll No.

Printed Pages : 3

37191

BT-7 / M-19

ADVANCED CHEMICAL PROCESSING - T

Paper-TT-405 N Opt-I

Time allowed : 3 hours]

[Maximum marks : 75

Note: *Question no. 1 is compulsory. Attempt one question from each of the sections A, B, C and D. All questions carry equal marks.*

Compulsory Question

1. (i) Enzyme used for the silk degumming
(a) Pectinase (b) Amylase (c) Protease
- (ii) Wash fastness of vat dyes ranges from
(a) 4-5 (b) 1-2 (c) 2-3
- (iii) Fastness to light graded using
(a) Grey scale (b) Blue wool standards
(c) Tegewa Scale
- (iv) Combined pre-treatment performed in machine
(a) CPB (b) CDR (c) CPR
- (v) Bleaching with.....is suitable for combined pre-treatment
(a) Sodium hypochlorite (b) Hydrogen Peroxide
(c) Chlorite
- (vi) Colour strength is measured in terms
(a) ΔE value (b) K/S value (c) R value
- (vii) Colour difference for shade matching using CCM is evaluated as
(a) ΔE (b) ΔL (c) Δa

37191

[Turn over

(2)

- (viii) Supercritical dyeing is also known as
 - (a) contactless dyeing
 - (b) waterless dyeing
 - (c) machineless dyeing
- (ix) Easy - care finish associated with chemical
 - (a) DMDHU
 - (b) Polysiloxanes
 - (c) Silver nano-particles
- (x) Which illuminant is equivalent to average day light?
 - (a) D55 (b) D65 (c) TL84
- (xi) What do you mean by Low wet pick-up techniques?
- (xii) What is metamerism?
- (xiii) What are bifunctional reactive dyes?
- (xiv) Which type of colour mixing law is followed in paper printers?
- (xv) What do you mean by water-proof breathable fabrics?

15×1=15

Section-A

- 2. Describe the continuous open width processing of textiles with neat machine diagram. 15
- 3. What is Supercritical CO₂ dyeing? Discuss in detail its concept, recipe detail and relevant technical information. 15

37191

Section-B

4. Describe the Ink jet printing technique with technical, process and ink details. 15
5. Write short note on the followings:
 - (a) Low liquor application techniques 8
 - (b) Zero-formaldehyde easy-care finish 7

Section-C

6. (a) Differentiate between natural and artificial source of light. What are CIE illuminants, explain? 8
- (b) What is Kubelka-Monk equation? Discuss its significance. 7
7. Write note on the following:
 - (a) Colour mixing laws 8
 - (b) Metamerism 7

Section-D

8. Describe the Munsell colour order system in detail. What is whiteness & Yellowness index? 15
9. Describe the process of recipe prediction using computer colour matching system with a neat flowchart. 15

Roll No.

Printed Pages : 3

24/05/2019

37194

BT-7 / M-19

PROCESS CONTROL IN GARMENTS-II

Paper-TT-419-N

Time allowed : 3 hours]

[Maximum marks : 75

Note : Question No. 1 is compulsory. Attempt at least one question from each section.

Compulsory Question

1. (a) Define automation. $10 \times 1\frac{1}{2} = 15$
- (b) What are the commercial PDS used in apparel designing? $10 \times 1 = 10$
- (c) Which stitch classes used for knitwear?
- (d) Define seam pucker.
- (e) What is fabric sewability?
- (f) What is needle cutting index?
- (g) What are the different types of needle tips?
- (h) What is understood by "quality control"?
- (i) How is audit inspection?
- (j) What are the advantages of corespun sewing threads?

Section-A

2. (a) Explain the features of the following : $2 \times 4 = 8$
- (i) Pattern making
- (ii) Marker Planning
- (b) What are the techniques used for production planning in apparel processes? Give suitable examples. 7

37194

[Turn over

(2)

3. (a) What are the methods used for time study and motion study?
Mention the need of the same. 7
- (b) Explain the concept of production analysis and efficiency. 8

Section-B

4. (a) Describe the properties, features and end-uses of stitch classes used for apparels. Also write about the sewing machines used for the stitch classes. 2+2+2+3
- (b) Write about the following : 2×3=6
- (i) Seam cracking
- (ii) Seam slippage
5. (a) How is the seam quality assessed ? Explain with logical reasons. 4
- (b) Explain the concept, types and causes of seam puckering. 6
- (c) What are the remedies to control seam puckering ? 5

Section-C

6. (a) How are sewing threads selected to optimize the seam quality? 4
- (b) What are the factors affecting the selection of sewing threads? Give examples. 6
- (c) Write briefly about the quality aspects of Industrial sewing threads for apparel production. 5

37194

7. Explain in detail about the sewability of fabrics and threads.
How is the quality of seams assessed ? 15

Section-D

8. (a) What is quality control for apparels ? 2
(b) Discuss the concept and significance of quality assurance for apparels. 4
(c) What are the inspection standards used for apparel ? 9
9. (a) What are the techniques used for raw material inspection and garment inspection ? 8
(b) How are comparability checks are carried out ? 7

10/05/2019

Roll No.....

Total No. of Page(s): 1

BT-7/ M-19: 37093
TT-401A: Technical Textiles –I

Time: 3 Hours]

[Max. Marks: 100

Note: Attempt any five questions, selecting at least one question from each section.

Section-A

1. a) Classify Technical Textiles and discuss the growth of each sector in reference to Indian conditions.
- b) What is the role of fabric construction in the development of technical textiles? 14+6
2. a) What technological innovations support the advancement of technical textiles?
- b) Write a note on India's approach to technical textiles. 10+10

Section-B

3. a) Explain filtration techniques for different media with examples.
- b) Discuss a few filtration equipments used in our daily life. 14+6
4. a) Highlight different fibres and fabric used in dry and wet filtration techniques along with special features.
- b) Enumerate the advantages and disadvantages of nonwoven filter media over woven filter media. 12+8

Section-C

5. a) What is meant by Geo-nets, Geo-mats, Geo-composites, Geo-membrane and Geo-cell?
- b) Explain the production methods of Geo-textile products. 10+10
6. a) Explain in detail the mechanics of reinforcement, filtration and drainage by Geotextiles.
- b) Enlist the important testing criteria required to evaluate a geotextile against a specific application? 10+10

Section-D

7. a) Describe the application of textiles in aircraft and marine.
- b) Discuss the mechanism of air bags used in transport vehicles for safety. 10+10
8. a) Comment on the suitability of textile fibres for use in automotive industry.
- b) Outline, in brief, the production technology of tyres and seat belts. 10+10

13/05/2019

Roll No.

Printed Pages : 2

37095

BT-7 / M-19

ADVANCED CHEMICAL PROCESSING

Paper-TT-417 opt.(Set-I)

Time allowed : 3 hours]

[Maximum marks : 100

Note : Attempt five questions in all, selecting at least one question from each section. All questions carry equal marks.

Section-A

1. Discuss continuous dyeing method. Explain direct dyes, its classification and application. 20
2. Describe regarding and method to determine fastness related to:
 - (i) Washing
 - (ii) Hot pressing treatment 20

Section-B

3. Describe Zero formal dehyde easy care finish. Give the use of nano particles in these finishes. Write a note on Digital printing method. 20
4. Discuss regarding 'Breathable Water Proof' fabrics. Explain 'Low Wet Pickup' techniques. 20

37095

[Turn over

(2)

Section-C

5. Differentiate between light source and illuminator. Discuss 'Beer-Lamberts Law'. Give the significance of extinction coefficient. 20
6. Discuss 'Kubelka Munk' equation giving relevant diagram. Explain :
 - (i) Metamerism
 - (ii) Chromaticity coordinates 20

Section-D

7. Explain the principle and application of spectrophotometer. Write a note on Perceived Colour and Location. 20
8. Describe computer aided colour matching mentioning its applications. Explain the relationship between hue, value and chroma. 20

37095

14/05/2019

Roll No.

Total Pages : 03

BT-8/M-19

38091

TEXTILE COSTING

TT-404-A

Time : Three Hours]

[Maximum Marks : 100

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

Unit I

1. Discuss the Fundamentals of Costing for Textile Industries. Also discuss the basic concepts of Costing. How Costing can be classified ? Explain your answer with the help of suitable examples of elements of Cost applicable in Textile Industries. 20
2. What do you mean by Unit and operating costing ? With the help of suitable examples, discuss the various methods of costing used in Indian Textile Industries. 20

Unit II

3. How to analyse cost and profit ? With the help of suitable examples, calculate the cost, volume and profit analysis of any Textile Unit, using own data. Also measure break-even analysis for a Spinning unit using standard data. 20

(2-62/3) L-38091

P.T.O.

4. What do you understand by Budgeting ? With the help of suitable examples and data, measure the Margin of safety and angle of incidence for a spinning mill. Also discuss capital budgeting. 20

Unit III

5. What is the role of raw material cost, labour cost and utilities cost in deciding the cost of yarn ? How cost structure is evolved in a ring frame of a spinning mill ? Determine cost per kg. of Ring-spun yarn using 32s count. Assume data yourself, if any. 20
6. What are the measures of cost reduction that generally taken in a Textile Composite mill to control cost ? Elaborate your answer with the help of suitable examples. Also discuss how yarn realization takes place in a Textile Composite mill. 20

Unit IV

7. What do you understand by Labour allocation in a Textile Mills ? Illustrate your answer with the help of example for a Textile Weaving unit. Enlist work-load standards for a Shuttle looms and Shuttle-less looms. Also, mention the measurement techniques of work-load standards. 20

8. What do you understand by "Economics of Shuttle Loom"? With the help of suitable examples, compute costing-sheet of Shuttle Loom and Shuttle-less Looms and explain how the Shuttle-less Looms are economically viable over Shuttle Looms.

20

22/05/2019

Roll No.

Total Pages : 03

BT-8/M-19

38093

HIGH PERFORMANCE FIBRES

TT-426A

(Elective III) Opt. I

Time : Three Hours]

[Maximum Marks : 100

Note : Attempt any *Five* questions from the Sections by attempting at least *one* question from each Section.

Section A

1. (a) What are Aramids ? Explain the monometric units, spinning technology and properties of Kevlar. 12
(b) Discuss the applications areas of Nomex for technical end uses. 8
2. (a) Why is PBO an "Ordered Polymer" ? Explain the production process of the ordered polymers. 10
(b) Describe the properties and end uses of PBI and PBZT. 10

Section B

3. (a) Explain the following terms :
(i) Pitch fibres
(ii) Liquid crystal fibres. 2×5

(3-41/7) L-38093

P.T.O.

- (b) How is carbon fibre produced from carbonization and graphitization processes ? 10
4. (a) Explain the structure and properties of liquid crystal fibres. 10
- (b) Draw a neat sketch of gel spinning of fibres. 10

Section C

5. (a) What are the features of UNNWPE ? Discuss the monomers and production sequence of dyneema. 12
- (b) How is spectra used for different technical applications ? 8
6. (a) Write about the different raw-materials used for production of optical fibres. Also, mention the applications of optical fibres. 6
- (b) Draw and explain the concept of fibre optics. 6
- (c) What are hollow and profile fibre ? How are these produced ? 8

Section D

7. (a) Explain the concept of membrane technology and bicomponent fibre in technical applications. 10
- (b) What are the features of glass fibres and soybean fibres ? 10
8. Describe the following :
- (a) Plasma Modification
- (b) Radiation Processing
- (c) Barrier films and coatings
- (d) Industrial tapes. 5×4=20

25/05/2019

Roll No.

Total Pages : 03

BT-8/M-19

38095

NON-WOVEN TECHNOLOGY (Elective-IV)

TT-434A

Time : Three Hours]

[Maximum Marks : 100

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

Unit I

1. What are Non-woven fabrics ? Classify different types of Non-woven fabrics. With the help of suitable examples, show different manufacturing techniques of Non-woven fabrics. Also discuss the various fibres and their properties mostly used in Non-woven Fabrics. 20
2. What are different laying techniques used for WEB Formation ? Compare between parallel and cross-laying techniques. Also, discuss the various types of Wet Laying Techniques for Web Formation. Explain your answer with the help of neat sketches. 20

(2-92/1) L-38095

P.T.O.

Unit II

3. What are the Needle-Punching Techniques used for Mechanical bonded Nonwoven fabrics ? With the help of suitable examples and neat sketches, explain the manufacturing techniques of needle_punched non-woven fabrics. Also discuss how the needle board parameters, needle density and needle penetration affect the fabric parameters. 20
4. What are the Stitch-Bonded Non-woven Fabrics ? With the help of neat sketches, discuss the manufacturing techniques of Stitch-Bonded Non-woven Fabrics using Maliwat bonding techniques. Also discuss the factors which affect the production and quality of Stitch-Bonded Non-woven Fabrics. 20

Unit III

5. What are the various bonding techniques for the development of Adhesive-Bonded Non-woven Fabrics ? Discuss the various types of forms and classes of binders that are used in Chemical-bonded Non-woven Fabrics. With the help of neat sketches, discuss the manufacturing techniques of Chemical-Bonded Non-woven Fabrics. 20

6. Compare between Spray Bonding and Print Bonding. Discuss the various factors that affect the properties of Calender-bonded products. Explain with the help of neat sketches, the production of Fusion-Bonded Non-woven Fabrics. Also discuss the properties of Thermal-Bonded Non-woven Fabrics developed by various techniques. 20

Unit IV

7. What do you understand by Dry Finishing of Non-wovens? With the help of examples, explain how Shrinkage and Glazing are controlled during Finishing of Non-wovens. Also, discuss with the help of sketches, the application of different dry finishes applied in Non-wovens.

20

8. What are the various techniques of WET Finishing of Non-wovens? With the help of neat sketches, explain washing, dyeing and chemical finishing techniques used in Non-woven fabrics. Also discuss the defects of Non-wovens, their causes and remedial measures. How to evaluate them? Explain.

16/05/2019

Roll No.

Total Pages : 06

BT-6/M-19

36137

THEORY OF TEXTILE STRUCTURE

TT-302-N

Time : Three Hours]

[Maximum Marks : 75

Note : Unit I (Q. No. 1) is compulsory. Answer any *one* question from each of the remaining four Units. All questions carry equal marks.

Unit I

1. (a) What is the unit of tenacity ?
 - (i) Gram/tex
 - (ii) Gram/centimeter
 - (iii) Newton/meter
 - (iv) None of these
- (b) What is the maximum possible surface angle in an ideal helical yarn in degrees ?
 - (i) 90
 - (ii) 180
 - (iii) 70.5
 - (iv) 72
- (c) What is the minimum value of twist contraction factor ?
 - (i) 0
 - (ii) 1
 - (iii) ∞
 - (iv) None of these
- (d) Which type packing provides more yarn density at 3rd layer ?
 - (i) Hexagonal
 - (ii) Open
 - (iii) None of these

(3-38/14)L-36137

P.T.O.

- (e) Which type of the following fabrics has made from the yarns having highest twist multiplier ?
- (i) Plain weave fabrics
 - (ii) Complex jacquard woven fabrics
 - (iii) Crepe fabrics
- (f) The tangent of surface twist angle ($\tan \alpha$) of an ideal helical yarn is :
- (i) Directly proportional to twist factor
 - (ii) Inversely proportional to twist factor
 - (iii) Directly proportional to filament diameter
 - (iv) None of the above
- (g) Mean fiber position of a filament in an ideal helical yarn will be :
- (i) is equal to the diameter of the yarn
 - (ii) is equal to the radius of the yarn
 - (iii) is twice of the diameter of the yarn
 - (iv) none of the above
- (h) Which of the following yarn structures have the best migration phenomenon ?
- (i) Compact yarns
 - (ii) Rotor yarns
 - (iii) Airjet yarns
 - (iv) Friction spun yarns

- (i) Maximum extension of a fiber/filament during tensile loading is observed at :
- (i) The filament is at 0°
 - (ii) The filament is at 20°
 - (iii) The filament is at 30°
 - (iv) The filament is at 40°
- (j) As per the Hearle-El-Sheikh's theory, the loss of contribution to yarn tension is affected by :
- (i) Fiber length
 - (ii) Fiber friction
 - (iii) Number of turns per unit length
 - (iv) All of the above
- (k) Why specific stress is more appropriate for the specification of spun yarns ?
- (i) Due to non-uniformity of the yarn
 - (ii) Due to flexibility of the yarn
 - (iii) Due to visco-elastic nature of fibers
 - (iv) All of the above
- (l) Which of the following weave structures having maximum crimp ?
- (i) 1/1 Plain woven
 - (ii) 3/1 twill
 - (iii) 4 end satin
 - (iv) 4/2 twill
- (m) The thickness of a square balanced fabric as per Pierce's theory is :
- (i) $2d$
 - (ii) $2h$
 - (iii) All of these

(n) 3/3 twill with 48 ends per cm is to be changed to 3 end twill. How many threads per cm are required in the new weave to give the same firmness as old weave ?

- (i) 36.2 (ii) 38.4
(iii) 40.1 (iv) 42.6

(o) Calculate the crimp in a square non-jammed fabric if the thread spacing is equal to the yarn diameter :

- (i) 56.25 (ii) 65.34
(iii) 31.1 (iv) None of these

1×1=15

Unit II

2. (a) Derive a suitable mathematical expression for twist retraction factor of an ideal helical yarn. Also determine the maximum twist retraction factor for an ideal helical yarn. 10

(b) Find out the twist contraction factor of a cotton yarn of 30 Ne and it has 760 turns per metre. 5

3. (a) A closed packed ideal helical yarn consists of layers. Then find out the number of fibers in each layer, total number of fibers in the yarn, packing coefficient of the yarn and the radius of the yarn. 10

(b) Discuss the different parameters which make the closed packed form to differ from real yarns. 5

30/05/2009

Roll No.

Total Pages : 03

BT-6/M-19

36141

COMPUTER AIDED FABRIC

MANUFACTURING

TT-310N

Time : Three Hours]

[Maximum Marks : 75

Note : Q. No. 1 is compulsory. Attempt any *four* questions taking *one* question from each Section A, B, C and D.

1. Attempt all the questions :

- (a) Define CAD.
- (b) What is CAM ?
- (c) What is Electronic Dobby ?
- (d) Define Electronic Jacquard.
- (e) What is narrow Fabric ?
- (f) Define CARPET.
- (g) What is Fabric Simulation ?
- (h) What do you mean by Weave Simulation ?
- (i) What is Design ?
- (j) What is Embroidery ?

15

(3-109/13)L-36141

P.T.O.

Section A

2. What is CAD ? Compare between CAD and CAM. Explain briefly the benefits of CAD and CAM. Also discuss the applications of CAD and CAM in various fields of Textiles and Apparels. 15
3. What do you mean by Fundamentals of Design ? With the help of suitable motif, explain the development of printable designs using ArahPaint. Also, discuss the working of various tools of ArahPaint Software. 15

Section B

4. What is Electronic Dobby ? With the help of neat sketches, discuss the working principle of Electronic Dobby. Explain, with the help suitable motif, design development using Electronic Dobby. 15
5. What do you understand by Electronic Jacquard ? With the help of neat sketches, discuss the working principle of Electronic Jacquard. Explain, with the help of suitable motif, design development using Electronic Jacquard. 15

Section C

6. What is the importance of CAD in Dobby Designing ? How doobby designs are developed through ArahWeave Software ? Explain with the help of suitable motif. 15
7. What are the uses of CAD in jacquard designing ? With the help of suitable motif and sketches, discuss the jacquard design development using ArahWeave software. 15

Section D

8. What are motif and figures ? With the help of suitable motifs, explain how figures are arranged in different methods. Also discuss the various techniques of Geometrical ornamentations. 15
9. What do you understand by "Embroidery" ? With the help of neat sketches, explain how CAD is useful in Embroidery designing ? Illustrate your answer with the help of suitable motifs and designs. 15

3/05/2014

Roll No.

Total Pages : 06

BT-6/M-19

36142

MULTI FIBRE SPINNING

TT-312N

Time : Three Hours]

[Maximum Marks : 75

Note : Section A (Q. No. 1) is compulsory. Answer any *one* question from each of the remaining four Sections. All questions carry equal marks.

Section A

1. (a) The weight of jute which is fed on to 'clock length' of feed sheet is called ?
- (a) Poud
 - (b) Dollop
 - (c) Grains
 - (d) Grams
- (ii) Which of the following spinning system processes long stape fibre ?
- (a) Woolen Spinning
 - (b) Cotton Spinning
 - (c) Worsted Spinning
 - (d) Semi-worsted Spinning

(3-33/10)L-36142

P.T.O.

- (iii) Neutralizing process is used after wet carbonizing :
- (a) to enhance the wool properties
 - (b) to neutralize acid used
 - (c) to remove wax, oil and dust
 - (d) all of the above
- (iv) For trouble free carding, ratio of fibre length in mm to fibre denier should not exceed :
- (a) 25 (b) 35
 - (c) 45 (d) 55
- (v) The breaker cards in Jute spinning are :
- (a) Down striking and full circular
 - (b) Up striking and half circular
 - (c) Up striking and full circular
 - (d) Down striking and half circular
- (vi) TiO_2 is added to manmade fibres as :
- (a) Delustering (b) Lustering agent
 - (c) Increase crimp (d) Decrease crimp
- (vii) Most important fibre properties for cotton spinning system is :
- (a) Staple length (b) Fineness
 - (c) Cross-section (d) Crimp

(viii) Woolen count is expressed as :

- (a) 250 yards in 1 lb
- (b) 840 yards in 1 lb
- (c) 520 yards in 1 lb
- (d) 256 yards in 1 lb

(ix) Directional Friction in wool is due to :

- (a) Crimp
- (b) Scales
- (c) Impurities
- (d) High moisture regain

(x) The objective of polyester blend with Cotton/Viscose is :

- (a) Increase production at ring frame
- (b) For economic purpose
- (c) Reduce end breakages
- (d) All of the above

(xi) Bread ford system and french or continental system respectively involves :

- (a) Dry and oil combing
- (b) Noble combing and rectilinear combing
- (c) Noble combing and oil combing
- (d) Rectilinear combing and Dry combing

(xii) Gilling operation mostly removes :

- (a) Trailing hooks
- (b) Leading hooks
- (c) Leading and trailing equally
- (d) None of the above

(xiii) Jute flyer works on :

- (a) Flyer leading principle
- (b) Bobbin leading principle
- (c) On both flyer and bobbin leading
- (d) Both flyer and bobbin run at same speed

(xiv) For cotton spinning, highest waste extracted at :

- (a) Carding
- (b) Blow room
- (c) Comber
- (d) Winding

(xv) Best quality wool among the following is :

- (a) Cross bread
- (b) Carpet wool
- (c) Merino
- (d) Long wool

Section B

2. (a) Discuss the objective of a blending process. Discuss different technique and stages of blending during spinning along with their advantages and disadvantages. 10
- (b) Discuss the changes required on a carding machine if polyester is to be process in place of cotton fibre. 5
3. (a) Mention the change in the fibre properties after dyeing. Discuss the precaution required during spinning of dyed fibres yarn. 10
- (b) Discuss the change required on a ring frame to process polyester fibre in place of cotton fibre. 5

Section C

4. (a) What are different types of impurities present in wool fibre ? Mention how they are added in wool fibre. 8
- (b) What is Gilling ? Explain working of gilling machine. 7
5. (a) Give a flowchart of spinning process for woollen and worsted yarn. Mention the difference in properties of these yarns. 10
- (b) What is back washing of wool ? 5

Section D

6. (a) Give a detailed classification of different types of Jute yarns. 8
(b) Explain the process of batching of Hessian Yarn. 7
7. (a) With the suitable diagrams, explain the principle of carding in Jute spinning. 9
(b) Mention different jute fibre defects. 6

Section E

8. Discuss different type of waste generated in cotton spinning. Briefly discuss the condensor system of waste spinning. 15
9. Give a detailed note on spun silk yarn manufacturing. 15

Roll No.

Total Pages : 04

BT-6/M-19

36074

THEORY OF TEXTILE STRUCTURE

TT-302-A

Time : Three Hours]

[Maximum Marks : 100

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

Unit I

1. (a) What are the different types of yarn with respect to structures ? Also describe the concept of idealized helical structure. 5
- (b) State the reasons of twist contraction. Also discuss the parameters used for twist contraction and prove the following expression : (α is the surface angle of twist) : 15

$$\text{Twist Retraction Factor} = \tan^2 \frac{\alpha}{2}$$

2. (a) Discuss the different types of packing of fibers in yarn and give a comparative assessment of radius of yarn, packing coefficient and total number of fibers at the 7th layer. 14

(2-70/13)L-36074

P.T.O.

- (b) State the significance of Schwarz's constant for yarns containing few fibres. Also derive an expression for Schwarz's constant. 6

Unit II

3. (a) What is the concept of ideal migration ? Also describe the experimental techniques used for the observation of the paths of individual fibers. 12
- (b) How the migration of unitary yarns differs from two components blended yarns ? Also state the factors which affect the migration behaviour of blended yarns. 8
4. (a) Describe the mechanism of fiber migration. Also state conditions for migration to occur. 5
- (b) Discuss the different parameters used to characterize the fiber migration. Also mention the morton and his associates techniques used to study the fiber migration behaviour. 15

Unit III

5. (a) State the parameters used for the study of tensile behaviour of filament yarns with the help of stress-strain curve. 6

- (b) Analyze the tensile behaviour of filaments considering the transverse forces and lateral contraction. Also derive an expression for filament strain. 14
6. (a) Discuss the causes of breakages in staple fiber yarns with suitable figures. 10
- (b) What is significance of Hamburger's model ? Also mention the concept and condition of strictly yarns. 10

Unit IV

7. (a) State the significance of Crimp interchange equation. Also calculate theoretical maximum fractional cover value of a plain woven fabric using Pierce's fabric geometry. 15
- (b) Calculate the crimp and cover factor for a square fabric woven with the following particulars : 5
Yarns per cm = 24, yarn Tex = 50, fiber density = 1.14 gm/cm³, yarn packing coefficient = 0.5.
8. (a) Discuss the merits and demerits of Kemp's race track model. Also state the various inferences from this theory. 15

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- (b) If a given cloth is woven with 28 yarns per cm of 64^s yarn count. It desired to keep the same weave ut to have only 25 threads per cm. What count of yarn must be used ? 5

20/05/2019

Roll No.

Total Pages : 03

BT-6/M-19

36075

TEXTILE TESTING-II

TT-322

Time : Three Hours]

[Maximum Marks : 100

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

Section A

1. (a) Define the terms related to flammability. How can these be measured ? Explain in detail.
(b) What is meant by shower proofness ? How can it be measured ? Explain in detail. **10+10**
2. (a) With the help of a neat and clean diagram explain the standard test method for measuring air-permeability of a fabric. List the precaution to be taken.
(b) Explain the principle and working of Shirley Stiffness Test. Define the parameters obtain from it. **10+10**

(3-93/5) L-36075

P.T.O.

Section B

3. (a) Differentiate Grab test from Strip Test. Which is more accurate and why ?
- (b) Explain the principle and working of ELMENDORF Tearing strength tester. **6+14**
4. (a) Discuss the factors which affect the results of tensile tester of a fabric.
- (b) How can the drape of a fabric be assessed ? Discuss the method in detail. **10+10**

Section C

5. (a) How can comfort be classified ? Which type of comfort is more important for sportswear and why ?
- (b) What properties of a fabric are evaluated through KES ? How KES is different from FAST ? **10+10**
6. (a) Discuss any *one* method used to measure Thermal Insulation of a fabric.
- (b) Explain the mechanism of water absorption in a fabric acid discuss any one method/instrument in detail for its measurement. **10+10**

Section D

7. (a) Draw a typical stress-strain curve to show mechanical behaviour of textiles and define all parameters related to tensile testing.
- (b) How many types of statistical quality control charts are there ? Which one is used in relation to percentage defectives of fabric ? How are tolerance limits calculated ? 12+8
8. (a) Discuss important fabric properties which need to be tested for Geosynthetics ? Explain any one method/technique.
- (b) Write notes on any *two* of the following :
- (i) Special tests for carpets and non-wovens
 - (ii) Tests for moisture transmission through breathable fabrics
 - (iii) Test for Medical Textile Products. 10+10

18/05/2019

Roll No.

Printed Pages : 4

34137

BT-4 / M-19

YARN MANUFACTURING- II

Paper- TT-202N

Time allowed : 3 hours]

[Maximum marks : 75

Note : Section-A (Question no. 1) is compulsory. Answer any one question from each of the remaining four sections. All questions carry equal marks.

Section-A

1. (i) Which material is used for nipper in modern comber ? 15×1
 - (a) Iron
 - (b) Aluminium
 - (c) Copper
 - (d) Rubber
- (ii) In a cotton comber noil extraction noil increase :
 - (a) With a decrease in detaching setting
 - (b) With an increase in pre combing draft
 - (c) If majority of hooks are presented in leading direction
 - (d) With an increase in shorter fibres
- (iii) What is the right sequence of forward feeding?
 - (a) Combing → Detachment → Feed → Combing
 - (b) Combing → Feed → Combing → Detachment
 - (c) Detachment → Combing → Feed → Combing
 - (d) Combing → Feed → Detachment → Combing
- (iv) Combing does not remove :
 - (a) Neps
 - (b) Short fibres
 - (c) Trash
 - (d) Coloured fibres

34137

[Turn over

- (v) Automatic doffing can occur in:
- (a) Bottom driven flyer
 - (b) Top driven flyer
 - (c) Closed flyer
 - (d) None of above
- (vi) Twist per inch and roving hank are related to each other as:
- (a) $TPI = HANK \sqrt{TM}$
 - (b) $TM = TPI \sqrt{HANK}$
 - (c) $TM = HANK \sqrt{TPI}$
 - (d) $TPI = TM \sqrt{HANK}$
- (vii) Long cradle is used in simplex machine for:
- (a) Combed cotton
 - (b) Carded cotton
 - (c) Synthetic fibers
 - (d) Same for all
- (viii) In case of processing of Synthetic fiber on roving frame:
- (a) Machine speed should be high
 - (b) Size of spacer should be large
 - (c) More TPI is required as compared to cotton
 - (d) Winding of bobbin should be at high speed
- (ix) If fibre length is changed from 32mm to 51mm, which drafting elements need to be change:
- (a) Spacer
 - (b) Cradle
 - (c) Saddle
 - (d) Top cot
- (x) Spacer is used on:
- (a) Comber
 - (b) Carding
 - (c) Ring frame
 - (d) Doubling
- (xi) Speed of which part changes at simplex with increase in package diameter:
- (a) Spindle
 - (b) Flyer
 - (c) Bobbin
 - (d) Front roller

34137

(xii) The increase in traveler weight results an increase in :

- (a) Yarn twist (b) Traveller lag
(c) Yarn tension (d) Balloon diameter

(xiii) Size of balloon in ring spinning is affected by :

- (a) ABC ring (b) Spacer
(c) Seperator (d) Traveller clearer

(xiv) Doubling reduces :

- (a) Strength (b) Unevenness
(c) Diameter (d) All of these

(xv) If 30 Ne yarn is doubled at doubling, the resultant count of yarn will be around :

- (a) 30 Tex (b) 40 Tex
(c) 50 Tex (d) 60 Tex

Section-B

2. (a) What are the objective of combing? Explain the process of combing with neat and clean diagrams. 9
(b) Discuss different setting that affects the level of noil extraction. 6
3. (a) Calculate the production of a combing machine (Kgs/shift) with following parameters : 7
Nips/min- 450; No of heads- 8; Feed/nip- 5mm;
Lap Hank- 65Ktex; Efficiency- 86%; Noil%-16
(b) Define forward and backward feeding at comber. How noil level changes with feed type. 8

34137

[Turn over

Section-C

4. (a) Discuss the changes required at simplex to process man made fibre in place of cotton fibres. 8
(b) Discuss different type of roving and package defects generated at simplex. 7
5. (a) What is bobbin leading and flyer leading concept? Which is used now a days and why? 8
(b) What and how different objective of a building mechanism is achieved in speed frame? Discuss with diagrams. 7

Section-D

6. (a) Discuss the principle of twisting and winding at ring spinning. 8
(b) Discuss the design of spindle and mention the importance of different section of spindle. 7
7. (a) Discuss different type of ring alone with their advantages and disadvantages. 8
(b) Discuss the modern development in ring spinning. 7

Section-E

8. (a) Mention the feed package requirement for plying. 5
(b) What are the advantages of a doubled yarn over single yarn? Explain the principle of TFO with suitable diagrams. 10
9. (a) Calculate the production in kgs/spindle/shift if spindle rotates at 6000 rpm and 36^s single yarn is doubled with a TM of 2.7. Assume efficiency of machine is 92%. 7
(b) Discuss different system of dry and wet doubling. 8

34137

22/05/2019

Roll No.

Printed Pages : 4

34138

BT-4 / M-19

FABRIC MANUFACTURING-II

Paper- TT-204-N

Time allowed : 3 hours]

[Maximum marks : 75

Note : Question no. 1 is compulsory. Answer any one question from each of the remaining four units. All questions carry equal marks.

1. (a) Which type of package is used for picking in shuttle looms?
 - (i) Cone
 - (ii) Warper's beam
 - (iii) Pim
 - (iv) Cheese
- (b) In case of 3/1 twill weave the healds will return to the same position in
 - (i) Every pick
 - (ii) Two picks
 - (iii) Three picks
 - (iv) Four picks
- (c) What will be the phase difference between the shedding cams for the 1/1 plain weave?
 - (i) zero degree
 - (ii) 90 degrees
 - (iii) 180 degrees
 - (iv) 270 degrees
- (d) What will be the type of Jaquard if the cylinder turns in every pick :
 - (i) Single lift and single cylinder
 - (ii) Double lift and single cylinder
 - (iii) Double lift and double cylinder
 - (iv) None of the above
- (e) The typical heald dwell (in degrees) of a tappet shedding shuttle loom is :

34138

[Turn over

(2)

- (i) 100 (ii) 120
(iii) 60 (iv) None of the above
- (f) What is the function of Temples :
- (i) To control the warp tension
(ii) To control the weft breakages
(iii) To stop the loom in case of weft breakages
(iv) To stop the fabric width contraction
- (g) If the picks inserted per minute is 200 then the R.P.M. of the shuttle loom is :
- (i) 100 (ii) 200
(iii) 400 (iv) None of the above
- (h) What will be the pick spacing for a 5 wheel take up motion with 50 teeth of change wheel :
- (i) 1/40 inch (ii) 1/200 inch
(iii) 1/100 inch (iv) None of the above
- (i) Which of the following are used to control the warp tension:
- (i) Shedding (ii) Take up
(iii) Let off (iv) None of the above
- (j) Loose reed mechanism is used for the :
- (i) Warp stop (ii) Weft stop
(iii) Warp protection (iv) None of the above
- (k) Centre weft fork motion detects the weft break in :
- (i) Every pick (ii) Two picks
(iii) Four picks (iv) None of the above

34138

(3)

- (l) Keighley dobby is a :
- (i) Negative
 - (ii) Positive
 - (iii) Continuous
 - (iv) Intermittent
- (m) The preferred to be shedding mechanism for weaving of aA 20×20 irregular weave is :
- (i) Tappet
 - (ii) Dobby
 - (iii) Jacquard
 - (iv) None of the above
- (n) As per Stockport system, the reed count is :
- (i) Number of dents per 2 inch
 - (ii) Number of dents per 1 inch
 - (iii) Number of dents per 10 cm
 - (iv) Number of dents per 1 cm
- (o) What will be the ratio of crank shaft to bottom shaft in a shuttle loom for a 1/1 plain weave :
- (i) 1/2
 - (ii) 2/1
 - (iii) 1/1
 - (iv) None of the above

15×1

Unit-I

2. (a) What are the objectives of beat up motion? Also derive an expression of velocity of sley. 10
- (b) Sketch the warp path in shuttle loom and stating the function of each component. 5
3. (a) Discuss the different types of picking mechanism used in shuttle looms with their features. Also explain the over-pick mechanism with suitable sketches. 10

34138

[Turn over

(4)

- (b) Describe the nominal and actual displacement of shuttle with figures. 5

Unit-II

4. (a) What are the special features of 7 wheel take up motion? Also explain the working mechanism of 7 wheel take up motion with suitable figures. 7
- (b) Derive an expression for the pick spacing of a typical 7 wheel take up motion. 8
5. (a) Discuss the types and objective of warp protecting motion. 5
- (b) Explain the working mechanism of a FAST REED with suitable figures. 10

Unit-III

6. (a) What are the merits of automatic looms? Also state the different loom components used for automatic looms. 5
- (b) Describe the working mechanism of a automatic pirn changing with neat and labelled sketches. 10
7. Explain the working mechanism of 4×1 drop box mechanism with labelled figures. 15

Unit-IV

8. What are the different types of Jacquards? Also explain the working mechanism of a double lift double cylinder jacquard with suitable figures. 15
9. What is the function of a Dobby? Also explain the working mechanism of a double lift single jack dobbie with suitable figures. 15

34138

1/06/2019

Roll No.

Printed Pages : 3

34141

BT-4 / M-19

TEXTILE FIBER

Paper-TT-210-N

Time allowed : 3 hours]

[Maximum marks : 75

Note : Attempt any five questions in all, including question No. 1 which is compulsory. Select one question from each unit.

Compulsory Question

1. (a) What is Monomer ? 15×1=15
(b) What do you mean by Polymer ?
(c) Define Elastomers.
(d) What do you understand by Thermoplastic ?
(e) What do you mean by Nylon 6 ?
(f) Define Polypropylene.
(g) What do you mean by Solution Spinning ?
(h) What is Melting Temperature ?
(i) Define Glass Transition Temperature.
(j) What do you mean by Textile Fibre ?
(k) What do you mean by Viscose Fibre ?
(l) What is Acrylic Fibre ?
(m) What do you mean by DMT Route ?
(n) What are Dry and Wet Spinning techniques ?
(o) Define Gas Phase Polymerisation.

34141

[Turn over

Unit-I

2. With the help neat diagram, explain the amorphous and crystalline structure of fibre forming substances for Natural Textile Fibre. What are the various properties of Polymers required to be used as Natural Vegetable Fibres? 15
3. What do you mean by polymerization and its techniques? With the help of neat diagrams and suitable examples, explain Polymerisation techniques and mechanisms for synthetic fibre forming substances. 15

Unit-II

4. What are Man-made fibres? How Nylon fibre differs than Viscose fibres? Discuss in detail the manufacturing techniques and polymerisation of Nylon fibres/filaments that are used in Apparel sector. 15
5. What are Synthetic fibres? With the help of neat sketches, discuss the manufacturing techniques and polymerisation of Polyester fibres/Filament yarns. Also discuss the uses of Polyester fibres in Textile Apparel and Industrial sector. 15

Unit-III

6. What do you understand by MELT Spinning ? How it differs with Solution Spinning ? With the help of neat diagram, explain the working principle of Textile Fibre formation using Melt Spinning techniques. 15
7. What are Solution Spinning Techniques ? With the help of neat sketches, discuss the manufacturing of filament yarns using Solution Spinning Techniques. Also discuss the effect of spinneret size on the properties of filament yarns. 15

Unit-IV

8. What do you mean by Wet Spinning techniques ? With the help of neat sketches, explain the filament and fibre formation techniques of Viscose yarn. Also, mention how the viscosity and spinneret size and shape affects the structure and properties of Viscose filaments/fibres. 15
9. Compare between DRY Spinning and DRY-JET Wet Spinning. With the help of neat diagram, explain the manufacturing process of any type of filament/fibre using above spinning techniques. Also, discuss the effect of spinning variables on structure and properties of such fibres/filaments.