

KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4137

(Waste Management and Pollution Control in Textile)

Time: 3 Hours

Total Marks: 210

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

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

- | | | |
|------|---|----|
| 1(a) | What is atmosphere? Mention the composition of atmosphere with pie chart. | 06 |
| 1(b) | Write down the causes and remedies of greenhouse effect. | 10 |
| 1(c) | What is greenhouse effect? How is the energy trapped and caused global warming? | 13 |
| 1(d) | Define the following terms:
i) Weather, ii) Climate, and iii) Pollutant. | 06 |
| 2(a) | What is bioaccumulation? What are the adverse effects of heavy metal? | 09 |
| 2(b) | What are the major water pollutants? | 05 |
| 2(c) | How aquatic life is hampered due to eutrophication? | 06 |
| 2(d) | What is industrial pollution? Describe the causes and effects of industrial pollution. | 15 |
| 3(a) | What is global warming potential? How global warming can be reduced? | 12 |
| 3(b) | Describe different systems used in textile for controlling air pollution. | 10 |
| 3(c) | How does air pollution contribute to acid rain? | 07 |
| 3(d) | How air pollution can be controlled? | 06 |
| 4(a) | What is noise pollution? Write down the effects of noise at decibel levels. | 10 |
| 4(b) | Describe different techniques of noise prevention. | 10 |
| 4(c) | Point out the noise with decibel level of the following section:
i) Spinning, and ii) Weaving section. | 15 |

SECTION-B

- 5(a) Write down the characteristics of waste water to be discharged into the environment. 05
- 5(b) What is meant by 'membrane technology'? Among different membrane filtration techniques, which one is best for waste water treatment and why? Explain. 07
- 5(c) "Electro-coagulation is the combination of oxidation, flocculation, flotation, and metal removal process"- Explain the statement with proper sketch and chemical reactions. 15
- 5(d) Write short notes on: 08
i) BOD, ii) COD, iii) TDS, and iv) TSS.
- 6(a) Why sludge return tank is necessary in biological plant? Why sludge return tank is not called sludge tank? 10
- 6(b) How does micro-organism decompose the waste of biological effluent treatment plant? Explain with chemical reaction. 10
- 6(c) Show the flow chart of biological effluent treatment plant and state their functions of each section. 15
- 7(a) What is meant by recycling? Explain the recycling methods according to resources. 06
- 7(b) How many ways textile waste can be handled? Among these, which waste management system is best and why? Explain. 07
- 7(c) Why soil separation is necessary from waste water? Why CPI (Corrugated Plate Interceptors) are more efficient than API (American Petroleum Institute) separators for oil separation? 10
- 7(d) What is dewatering of sludge? Why mechanical dewatering system is more effective than chemical dewatering system? Explain with proper sketch. 12
- 8(a) Why foam dyeing is called eco-friendly technique? Describe the foam dyeing technique with schematic diagram. 12
- 8(b) What is meant by sedimentation? Sketch the sedimentation basin with mentioning the functions of different zones. 08
- 8(c) Mention the limit of eco-parameter for finished garments. 08
- 8(d) State the ways by which you can reduce the unused dyes and chemicals in dyeing process. 07

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4133

(Technical Textiles)

Time: 3 Hours

Total Marks: 210

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

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

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|------|---|----|
| 1(a) | What is technical textiles? Classify different fields of technical textiles. | 12 |
| 1(b) | Describe different fiber architecture and fabric constructions for healthcare and hygiene products in medical textiles. | 13 |
| 1(c) | Verify the differences between Chitin and Chitosan. | 05 |
| 1(d) | Write a short note on 'Sutures'. | 05 |
| 2(a) | Define Geotextiles according to GRI. Which fiber is preferable for subsurface drains and why? | 08 |
| 2(b) | Discuss the classification of Geotextiles. | 10 |
| 2(c) | How does Geotextiles prevent intermixing of soil layers? Mention the mechanism with required figures. | 10 |
| 2(d) | Mention the application of Geotextiles in Bangladesh. | 07 |
| 3(a) | Classify Automobile Textiles with examples. | 05 |
| 3(b) | Briefly discuss air bag mechanism of a car with flowchart. | 10 |
| 3(c) | Describe the basic construction of a tyre. | 10 |
| 3(d) | How can collapsible steering columns, vehicle crumple zone, and windshields reduce injuries in the event of a crush? | 10 |
| 4(a) | Make a critical comparison among Geogrids, Geonets, and Geomembranes. | 08 |
| 4(b) | Define awning and canopy. Mention the advantages of using awnings and canopies. | 07 |
| 4(c) | Discuss the mechanism of sound absorption in fibrous materials mentioning acoustic energy losses. | 12 |
| 4(d) | What is FRC? Mention the factors affecting the properties of FRC. | 08 |

SECTION-B

- 5(a) Briefly describe knife over blade coating method with suitable illustration. 10
- 5(b) What is Microencapsulation? Demonstrate how smart durable and self-healing finish can be done on textile surface by microencapsulation process. 10
- 5(c) Define Lamination process. Narrate the application of lamination process in textiles. 10
- 5(d) Write short note on 'chemical vapor deposition'. 05
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- 6(a) What is smart textiles? Differentiate among passive smart material, active smart material, and ultra-smart material. 10
- 6(b) What is PCM? How PCM works? 10
- 6(c) What is Nano Technology? Discuss different structures of Nano Particles in brief. 10
- 6(d) Mention the current technologies involved for making conductive textiles. 05
-
- 7(a) Define protective clothing. State the properties that are required for 'Protech'. 12
- 7(b) Explain the physiological comfort factors of sportswear. 08
- 7(c) Write short notes on: 15
- i) Extreme cold protective clothing.
 - ii) Biological protective clothing.
 - iii) Clean room textiles.
-
- 8(a) Define: Filtration process. Write down the factors affecting selection of filters. 10
- 8(b) Why nonwoven textile filter media is creating a hype in filtration process? Evaluate the reasons. 07
- 8(c) Demonstrate the requirements of nonwoven textile material as a filter media. 10
- 8(d) What is Nano-filtration? Demonstrate the applications of Nano-filtration process. 08

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4123

(High performance Fiber and Composites)

Time: 3 Hours

Total Marks: 210

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

SECTION-A

- 1(a) Define 'High Performance Fiber'. What are the essential parameters of a high performance fiber? 08
- 1(b) What is Aramid? Write down the synthesis of Para-aramid and Meta-aramid. 08
- 1(c) How the spinning of aramid fibers can be carried out? Describe the spinning process with schematic diagram. 12
- 1(d) Nylon and aramid both contain amide group but what are the basic reasons of higher strength of an aramid fiber compared to nylon fiber? 07
- 2(a) What is glass fiber? Describe the manufacturing process of glass fiber by direct melt process with suitable diagram. 14
- 2(b) What types of criteria are followed for choosing film former in glass fiber finishing? 06
- 2(c) Why do we need to use bi-component fiber? Write down the application of Bi-component fibers with specific functionality. 10
- 2(d) Classify the glass fiber based on applications. 05
- 3(a) Describe the fiber forming process from basalt rocks with appropriate diagram. 12
- 3(b) What is Basalt Rebar? Write down the applications of Basalt Rebar. 07
- 3(c) Mention the physical properties of ceramic fibers. 06
- 3(d) What are superabsorbents? What is the basic mechanism of absorption by a superabsorbent fiber? 10
- 4(a) What is carbon fiber? What are the manufacturing challenges of carbon fiber? 06
- 4(b) Explain the manufacturing process of 'Pitch' based carbon fiber with proper sketch. 15
- 4(c) Briefly discuss the different application areas of carbon nanotubes. 08
- 4(d) Why surface coating and tension are applied on carbon fiber during manufacturing? 06

SECTION-B

- 5(a) What is composite material? Write down the functions of matrix, and reinforcement. 10
- 5(b) Describe the fiber geometry for continuous, discontinuous, and random fibers. 12
- 5(c) Why longer fibers carry stress effectively? 05
- 5(d) Briefly describe particulate composites with neat sketch. 08
-
- 6(a) What is 2.D fabric? Explain the behavior of isotropic, orthotropic, and anisotropic composite materials to normal, and shear stresses. 10
- 6(b) Briefly discuss the development technique in non-woven technology for 3D preforms. 08
- 6(c) Mention the basic steps in composites manufacturing process. 04
- 6(d) Differentiate between thermoplastic composites and thermoset composites. 05
- 6(e) Mention types of fabric and preform construction for textile preforms. 08
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- 7(a) Describe pultrusion process for composite manufacturing with neat sketch. 10
- 7(b) Mention the name of main equipment of spray techniques with their features. 05
- 7(c) Describe different winding patterns of filament winding machine. 09
- 7(d) State the necessity of composite testing. Briefly describe tensile testing of composite materials. 11
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- 8(a) Define Lamina and Laminate. Briefly discuss CLT. 10
- 8(b) What is rule of mixture? A unidirectional glass/polyester has the following properties: 10
 $E_f = 250 \text{ GPa}$, $E_m = 15 \text{ GPa}$, and $V_f = 0.75$
Calculate the value of longitudinal modulus (E_1) and transverse modulus(E_2).
- 8(c) What is nanocomposite? How do you differentiate nanocomposite materials from conventional composite materials? 07
- 8(d) Briefly discuss In situ polymerization process for composite materials. 08

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4107

(Apparel Manufacturing Engineering-III)

Time: 3 Hours

Total Marks: 210

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

SECTION-A

- 1(a) Classify industrial garments washing. Why an industrial garment washing is done? 10
- 1(b) Describe the process recipe of Desize+Bleach+Softener wash of 80 Kg of denim long pant. 12
- 1(c) Sketch and label a horizontal garments washing machine. 08
- 1(d) Briefly describe the mechanism of the action of enzyme on textiles. 05
- 2(a) Calculate the fabric consumption of Men's Woven Trouser from the following specifications: 20

Description	Measurement (Inch)
Waist (Relaxed)	32
Thigh	25
Hip	46
Side Seam	40
Front Rise	11
Back Rise	13
Leg Opening	18
Fabric width	55
Allowances (Seam/ Sewing)	Assume
Wastages	Assume

- 2(b) Write down the factors influencing sewing thread consumption. 05
- 2(c) Write down the process sequence of acid wash of 100 Kg of sweater. 10
- 3(a) How vapor permeability of the textiles can be measured by Sweating Hot Plate method? Describe with appropriate diagram. 13
- 3(b) What are the requirements of construction of a thermal manikin according to BS EN ISO 15831: 2004? 13
- 3(c) Sketch and label the construction of a tog meter. 09

- 4(a) What are the advantages of garments dyeing over fabric dyeing? 08
- 4(b) Discuss the precautions regarding trims that should be taken before garments dyeing. 07
- 4(c) Mention the probable reasons for feeling discomfort during clothed situation. 10
- 4(d) Write short notes on (Any two) 10
- i) PERMETEST
 - ii) Kawabata Evaluation System
 - iii) Breathable fabrics

SECTION-B

- 5(a) Critically differentiate between hand scraping and sand blasting. 08
- 5(b) Define dry process in garment washing. Discuss the chronological processes of whisker making on denim. 13
- 5(c) Imagine a buyer is asking for the following dry processes on ordered 5-pkt basic denim pant. Illustrate and locate the areas of a denim pant where you can add/ perform the operations: 06
- i) Whisker, ii) Hand scraping, iii) Tagging, iv) Patch (3), v) Grinding, vi) Damage (3), and vii) PP touch.
- 5(d) State the merits and demerits of resin application. 08
- 6(a) Demonstrate the sequential steps in the final inspection process for garment export order. 17
- 6(b) What is AQL? Mention the importance of AQL in the apparel industry. 10
- 6(c) Highlight the points required for pre-production sample inspection. 08
- 7(a) Discuss the standard test method to determine Nickel release (BS EN 1811 and BS EN 12472). 13
- 7(b) Describe the worldwide regulations for 'Azo dyes' and 'Phthalates content' in apparel. 14
- 7(c) Describe the regulations across the world about 'Formaldehyde' content in apparel. 08
- 8(a) What is seam strength? Assume for a chain stitch, Stiches Per Inch (SPI) is 12; Single Thread Strength (STS) is 4 Kg. Calculate the seam strength. 12
- 8(b) Depict the basic mechanism of laser engraving with neat sketch. 10
- 8(c) Briefly discuss the complete flow-chart of dry processes and wet washing processes required to make a vintage denim. 13

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4105

(Wet Processing Engineering-III)

Time: 3 Hours

Total Marks: 210

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

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) What is meant by multi-nozzle soft flow dyeing machine? How does it dye the cotton fabric at low liquor ration? Explain with proper diagram. 10
- 1(b) 'SCLAVOS machine is getting popular in our country due to aquachron system'- Which types of advantages can we get from this system. Discuss with necessary diagram. 08
- 1(c) Describe the three steps of pigment dyeing on textile material. Why cationization and application of binder is necessary at the same dyeing process? Explain. 12
- 1(d) Mention the disadvantages of pigment dyeing. 05
- 2(a) Write down the classification of mordants that is used for natural mordant dyeing. 05
- 2(b) "Mordant not only assists to bond between natural dyes and fabric but also change the color"- how does mordant assist bond and change the color of natural dyes? Explain. 07
- 2(c) What is the basic difference between natural dye and natural mordant dye? Write down the procedure of premordanting process on cotton fabric. 10
- 2(d) "Fluorescent dyes treated fabric is more fluorescent under UV-light"- Explain this argument. 06
- 2(e) Suppose you have to dye cotton knitted fabric by using reactive fluorescent and pigment fluorescent- do you think it can be done at the same process and same machine? If yes or not, explain your argument. 07
- 3(a) Write short notes on: 08
i) Drop escape time, ii) Lamellae, and iii) Blow ratio.
- 3(b) What is super critical fluid? Mention the benefits of dyeing with super critical CO₂. 10
- 3(c) Write down the working principle of sc- CO₂ system with necessary figure. 10
- 3(d) Write down the reasons for using foam in wet processing. 07
- 4(a) What is meant by plasma? Write down the classification of plasma according to different aspects. 08
- 4(b) Describe the working principle of glow discharge plasma with necessary diagram. 12

- 4(c) If you want to apply monomer (gas) as functional finish chemical on textile material at plasma machine, how does plasma deposit this monomer on fabric by polymerization? Describe this mechanism with reaction. 10
- 4(d) Mention the names of plasma for following finishes: 05
 i) Hydrophilic, ii) UV Protection, iii) Flame retardant finish, iv) Antistatic finish, and v) Hydrophobic finish.

SECTION-B

- 5(a) Define the following terms: 08
 i) Adsorption, ii) Exhaustion, iii) Absorption, and iv) Color strike
- 5(b) What is adsorption isotherm? Describe various types of adsorption isotherm. 12
- 5(c) Discuss the factors which affect the dye-fiber interaction system. 10
- 5(d) What is enzyme? Write down the advantages of enzymes used in textile. 05
- 6(a) What is aggregation of dyes? Write the types of aggregation. 08
- 6(b) Write down the reasons of dye aggregation in dye bath and preventive steps to control this aggregation. 12
- 6(c) Describe the Pore model and Free volume model of dye diffusion in fibers with proper sketch. 15
- 7(a) What is synthetic thickener? Why synthetic thickener is better than emulsion thickener? 07
- 7(b) What is viscosity of print paste? How does it affect the hydrodynamic pressure in print paste? 08
- 7(c) Differentiate between flat and rotary screen printing. 05
- 7(d) Describe the working principle of flatbed screen printing with advantages and disadvantages. 15
- 8(a) Write short notes on: 08
 i) Dyeing equilibrium, ii) Softener, iii) Leveling agent, and iv) Detergent.
- 8(b) What is emulsion thickener? Write down the advantages and disadvantages of emulsion thickener. 08
- 8(c) Discuss the physio-chemical process of dyeing. 10
- 8(d) What are the reasons for blended dyeing? Mention the factors affecting the choice of dyeing methods in case of dyeing blends. 09

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4103

(Fabric Manufacturing Engineering-III)

Time: 3 Hours

Total Marks: 210

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

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) State the features of an automatic loom. 10
- 1(b) Briefly describe the mechanism of mechanical warp stop motion with neat sketch. 10
- 1(c) Make a list of differences between center weft fork and side weft fork motions. 10
- 1(d) When and why weft patterning motion is necessary? 05
- 2(a) Briefly describe the center weft fork mechanism with advantages. 13
- 2(b) What materials are used for making narrow fabrics? 07
- 2(c) Mention the main features of braid fabrics. 07
- 2(d) In Ahsan Weaving and Finishing Ltd. 20 looms produced 200000 m fabrics for 20 days. Find out, weaving efficiency of that factory if PPM and PPI are 750 and 90 respectively. 08
- 3(a) What is meant by costing? Classify costing. 05
- 3(b) What is weavers load? State the duties of a weaver. 10
- 3(c) What are the causes of warp and weft yarn breakage during weaving? 10
- 3(d) Calculate the price of $\frac{150 \times 120}{60 \times 50} \times 52''$ fabric if the required length is 1200 m. [Assume, warp yarn cost: \$ 10 per Kg, weft yarn cost: \$ 8 per Kg, Investment cost: \$ 0.45 per meter, and profit: 25%] 10
- 4(a) Write the features of lappet and swivel fabric. 10
- 4(b) Write the working principle of braiding machine. 15
- 4(c) Write short notes on velvets, and velveteen carpet. 10

SECTION-B

- 5(a) Mention the function of take up roller. 05
- 5(b) List out the factors on which the productivity of knitted fabric depends. 08
- 5(c) Differentiate between the yarn length counter and yarn speed meter measurement process. 12
- 5(d) What is meant by yarn linear density? Also indicate the importance of yarn linear density to produce quality knitted fabric. 10
- 6(a) What is meant by welt? Mention different types of welt. 10
- 6(b) Differentiate between widening and narrowing process. 10
- 6(c) Calculate the fashioning sequence of the following garment: 15

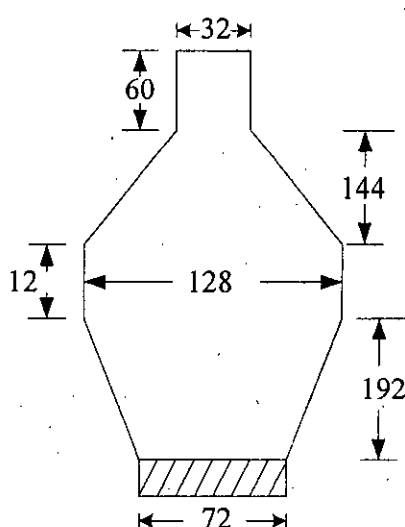


Fig: Panel Measurements converted into wales and courses.

- 7(a) Mention the function of peg and selector of mechanical jacquard machine. 10
- 7(b) How does CPI and WPI change with the change of loop length? 12
- 7(c) Write a short note on spirality of knitted fabric. 08
- 7(d) List out the main features of two thread fleece fabric. 05
- 8(a) Draw and describe a positive feeding system device. 10
- 8(b) What is meant by fleece sinker? 05
- 8(c) Define the following terms: 15
- i) Jack, ii) Selector, iii) Pin, and iv) Electrical Jacquard.
- 8(d) Why positive feed is better than negative feed system. 05

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4113

(Textile Testing-II)

Time: 3 Hours

Total Marks: 210

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

ii) Figures in the right margin indicate full marks.

iii) Assume reasonable data if missing any.

SECTION-A

- 1(a) What is bursting strength? For which fabrics this test is used? Describe the diaphragm bursting test with necessary figure. 13
- 1(b) Describe single rip tear test with figures and dimensions. 11
- 1(c) Explain fabric strip strength test with necessary figures. 11
- 2(a) Write short notes on: i) Air Porosity, and ii) Thermal comfort. 06
- 2(b) What is meant by breathable fabric? How to produce waterproof breathable fabric? 08
- 2(c) Explain the fabric properties those have effects on air permeability. 09
- 2(d) Describe a test method with figure for measurement of water vapor permeability. 12
- 3(a) Mention the different test methods for wet ability or water permeability of fabrics. 05
- 3(b) Differentiate between waterproof and showerproof fabric. 08
- 3(c) Write short notes on: i) Water retention, ii) Wet ability, and iii) Wetting time of a fabric. 09
- 3(d) How to carry out Bundesmann test for water penetration and absorption of fabric? Explain briefly with the assessment of the result. 13
- 4(a) Write short notes on: i) Multifiber fabric, and ii) Different light sources used in textile testing. 07
- 4(b) Explain the evaluation procedure of color fastness to light maintaining a standard. 07
- 4(c) Illustrate a format of test report of color fastness to rubbing indicating the standard. 09
- 4(d) What is color fastness? Describe a test of color fastness to wash according to an established standard. 12

SECTION-B

- 5(a) Briefly explain the reasons and remedies of pilling. 05
- 5(b) Narrate the factors affecting abrasion resistance. 06
- 5(c) Describe an abrasion resistance test with the evaluation procedure. 10
- 5(d) What is serviceability? Write down the advantages and disadvantages of both wearer trials and laboratory test. 14
-
- 6(a) What is Oeko-Tex? Write down the certification procedure of Oeko-Tex Standard 100. 11
- 6(b) Describe the product criteria according to GOTS. 10
- 6(c) Explain the certification levels of WRAP. 08
- 6(d) Describe ECHA's activities on Nano materials under REACH. 06
-
- 7(a) What is meant by BAN? Describe the process of BAN for estimation of the effect of mercerization. 11
- 7(b) What is desizing and why it is important? Describe the TEGEWA method for desizing efficiency estimation. 08
- 7(c) Describe a water hardness test method in details. 10
- 7(d) A water sample from KUET-ETP contains $MgCO_3 = 18 \text{ mg/L}$; $CaCl_2 = 16 \text{ mg/L}$; $MgSO_4 = 25 \text{ mg/L}$; and $CaCO_3 = 22 \text{ mg/L}$; Calculate the temporary, permanent, and total hardness of the water. 06
-
- 8(a) Mention the following items for 45° flame test: i) Sample preparation, ii) Interpretation of results, and iii) Purpose of the test. 15
- 8(b) Define carpet compression. Describe carpet compression test with neat sketch. 09
- 8(c) List down the chemical finishes along with their characteristics which are used to reduce the flammability of the treated fabric. 07
- 8(d) Define: i) Flame retardant fabric, and ii) Flame resistance rating. 04

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KHULNA UNIVERSITY OF ENGINEERING & TECHNOLOGY

Department of Textile Engineering

B. Sc. Engineering 4th Year 1st Term Examination, 2019

TE-4101

(Yarn Manufacturing Engineering-III)

Time: 3 Hours

Total Marks: 210

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

SECTION-A

- 1(a) Define mixing and blending. State the aims of mixing and blending. 08
- 1(b) Sketch and describe a modern flat bar. Where are the wastage removal systems attached in the modern carding machine? 07
- 1(c) Describe the automation of the following section of a modern cotton spinning mill- 20
i) Draw- frame, ii) Simples, iii) Ring frame, and iv) Winding section.
- 2(a) Describe a UNIstore of Rieter blowroom line with neat sketch. Mention modern blowroom line of an established company. 12
- 2(b) Which developments are done in UNIClean and Unimix in the upgraded model? Write short note on: Vision Shield. 06
- 2(c) Discuss the "Combo Shield" with neat sketch. 05
- 2(d) What are the advantages and types of chute feed system? Briefly describe the two piece chute system with a diagram. 12
- 3(a) Suppose you are a production manager of Auto-Tex Spinning Ltd., Savar, Dhaka. Now you are producing 30^S (K) hosiery yarn. At that time your factory GM (Production) suggested you for producing 60^S (C) yarn. What process parameters are to be changed for producing 60^S (C) yarn in lieu of 30^S (K) yarn from Blow-room to Ring frame? 30
- 3(b) Write short note on ring waste. 05
- 4(a) State the suction systems of the drafting arrangement with a diagram. What is RQM? 07
- 4(b) Describe the recent developments of ring frame. Write short note on: Compact Spinning. 08
- 4(c) Write down the types of hooked fibers with % are found in card sliver. Why lap preparation is necessary before combing? 10
- 4(d) Mention the waste% of different sections of cotton spinning mill. What is NRE%? 10

SECTION-B

- 5(a) State the theory of ballooning. Show the relation among the angle of pull (θ), ring dia., and bobbin dia. The value of angle of pull lies between 25-27° for proper spinning tension. If this value rises to above 30°; what steps are to be considered for reducing the end breakage rate of ring yarn? Give your own suggestions. 18
- 5(b) Define end breakage rate. Describe the causes and remedies of end breakage of yarn. 12
- 5(c) Write short note on: OMEGA lap winding process. 05
- 6(a) Make a list of the modern spinning systems for jute. 09
- 6(b) Describe the working principle of Teaser Card with neat sketch. 12
- 6(c) State the recent development of the followings: 14
- i) Jute Draw frame.
 - ii) Jute Spinning machine.
- 7(a) Describe the dust shaker-fraser with a diagram. 10
- 7(b) State the modernization of jute batching section. 10
- 7(c) Mention the jute yarn faults. 05
- 7(d) Make a list of the machines used for producing yarn from the jute waste. 10
- 8(a) Define unit arrangement of Jute Spinning machineries. Show unit arrangement of spinning machineries for modern or high drafting process. 10
- 8(b) Describe the types of wastages are found in Jute Spinning mill with their end uses. 15
- 8(c) What is pilling? How is it done by modern system? 05
- 8(d) Calculate the lb/spyndle from the following particulars: 05
- Flyer speed = 2800 rpm, TPI = 4, Efficiency = 90%, Production/hr of the frame = 58.32 lb, and No. of spindles = 100. Also convert it in Tex.

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