BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-2 Term-I, Final Examination-2018

Subject: Chemistry of Textile Chemicals and Auxiliaries (Code: WPE 203)

Time: 3.0 Hrs. **Full Marks: 72**

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A
(Answer any three questions)

1. (a) Define water hardness. Describe the problems that caused by hard water in textile wet processing.
   (b) State the standard quality parameters of dye house water.
   (c) Put down the chemistry involves in lime-soda ash softening of hard water.

[6+3+3=12]

2. (a) State the amount of water required in different wet processing operations of cotton textiles.
   (b) What is ion-exchange resin? Describe the ion-exchange process used in softening hard water with schematic diagram.
   (c) Differentiate between chelating agent and sequestering agent.

[2+6+4=12]

3. (a) Distinguish between sodium hypochlorite (NaOCI) and hydrogen peroxide (H_2O_2) bleaching mechanism.
   (b) How can we determine the degree of bleaching process?
   (c) What are the functions of stabilizer during bleaching process?
   (d) Describe the functions of antifoaming agents.

[3+3+3+3=12]

4. (a) Define colloids. Classify colloids with examples.
   (b) Describe the mechanism of colloidal formations.
   (c) What are the factors affecting the stabilization of colloid?

[3+4+5=12]

Part : B
(Answer any three questions)

5. (a) What is optical brightening agent (OBA)? What are the necessary properties we need to consider before selecting an OBA for textile application?
   (b) Describe the necessity of auxiliaries in textile dyeing industry.
   (c) State the uses of tannic acid and soda ash in textile dyeing.
   (d) Write the difference between acids and bases.

[4+4+2+2=12]

6. (a) What is thickener? State the classification of thickener.
   (b) Write the function and examples of the following printing ingredients: (i) Wetting agents, (ii) Hygroscopic agent, (iii) Catalyst (iv) Oxidizing agent (v) Reducing agent
   (c) Differentiate between dyes and pigments.

[5+5+2=12]

7. (a) Make a relationship of fabric softener with co-efficient of friction.
   (b) Classify different surfactants with examples. Briefly describe their advantages and disadvantages.
   (c) If you have 0.010M NH_3 and $K_b=1.8\times10^{-5}$. Calculate the pH.
   (d) Differentiate between dimethyldichloro silane and methylhydrogendichloro silane.

[2+5+2+3=12]

8. (a) Why hygroscopic agents are required to make the print pastes?
   (b) Compare the functions of oxidizing agents and reducing agents in print pastes.
   (c) Briefly describe the mechanism of dispersing agents.

[4+4+4=12]

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BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-2 Term-I, Final Examination-2018

Subject: Statistics (MS 201)

Time: 3.0 Hrs. **Full Marks: 72**

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A

(Answer any three questions)

1. (a) Define statistics. Discuss the role of statistics in textile industry.
   (b) Define primary data. Discuss the methods of primary data collection.
   (c) Arrange the following data in a frequency distribution and draw a histogram on the basis of the data:

34	36	31	46	76	86	42	44	32	46
40	54	66	56	50	42	33	80	77	81
46	40	60	63	64	76	56	57	57	70

[3+4+5=12]

2. (a) What do you mean by central tendency? Distinguish between arithmetic mean and harmonic mean.
   (b) What do you mean by geometric mean? The scores of 10 students of a college are 68, 70, 60, 64, 67, 50, 54, 60, 80, 74, find geometric mean.
   (c) Define mode. Calculate mode from the following wage distribution.

Wage	200-400	400-600	600-800	800-1000	1000-1200	1200-1400
No. of employee	12	18	20	20	7	3

[3+4+5=12]

3. (a) Distinguish between histogram and bar diagram.
   (b) Prove that $\beta_2 > \beta_1 + 1$, where the symbols mean usual meanings.
   (c) Arrange the following data in frequency distribution and draw a histogram and frequency polygon on the basis of the data:

40	38	44	28	60	21	35	42	40	36	50	67	25
58	30	48	65	35	55	39	72	44	70	55	53	21
76	46	57	67	51	34	41	56	62	42	64	73	38
41												

[2+4+6=12]

4. (a) Show that $\mu_4 = \mu_4' - 4\mu_3'\mu_1' + 6\mu_2'\mu_1'^2 - 3\mu_1'^4$.
   (b) A purchasing agent obtained samples of lamps from two suppliers. He had the samples tested in his own laboratory for the length of life with the following results:

700-900	10	3
900-1100	16	42
1100-1300	26	12
1300-1500	8	3

Which company's lamps are more uniform?
   (c) Compute mean, variance from the profit data related to 100 companies below:

Profit (Tk in lac)	20-30	30-40	40-50	50-60	60-70	70-80	80-90	90-100
No. of company	4	8	18	30	15	10	8	7

[2+5+5=12]

Part: B

(Answer any three questions)

5. (a) Define with example: (i) Sample space (ii) Mutually exclusive event (iii) Equally likely event (iv) Independent event.

   (b) The probability of a contractor getting contract for electricity fitting is 2/3 and the probability of his not getting contract for pipe fitting is 5/9. The probability of his getting at least one of two contacts is 4/5. What is the probability of his getting both the contracts?

   (c) Four unbiased coin are tossed at once. Write down the sample space and find the probability that- (i) at most two heads and (ii) same and equal opposite face.

[4+3+5=12]

6. (a) Define: (i) CRD, (ii) Experiment error, and (iii) Precision.

   (b) Write down the importance of time series.

   (c) Fit a straight line trend by the method of least squares to the following data:

Year	2013	2014	2015	2016	2017	2018	2019
Production (in tonnes)	12	10	14	11	13	15	16

Calculate the trend values and estimate the likely production for the year 2026. Interpret the values of a and b.

[3+4+5=12]

7. (a) Define design of experiment. Discuss its basic principles.

   (b) What is sampling? Discuss different types of sampling.

   (c) Define estimation. Distinguish between parameter and statistic.

[4+5+3=12]

8. (a) Write down the uses of "t-test".

   (b) The following figure relate to advertisement expenditure and sales:

Expenditure	60	62	65	70	73	75	71
Sales	10	11	13	15	16	19	14

Estimate the sales for advertisement expenditure of Tk. 80 Lac.

   (c) Per week weight (in pounds) of a calf from its birth is given below:

Age (x) in week	1	2	3	4	5	6	7	8	9	10
Weight (g)	52.5	58.7	65.0	70.2	75.4	81.1	87.2	95.5	102.2	108.0

Estimate the least squares regression of weight on age and also estimate the weight when the age in 6.5 weeks.

[2+5+5=12]

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BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-2 Term-I, Final Examination-2018

Subject: Apparel Manufacturing-I (Code: AE 205)

Time: 3.0 Hrs. **Full Marks: 72**

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A
(Answer any three questions)

1. (a) What is meant by backward linkage?
   (b) Explain the role of a textile engineer in textile industry & RMG sector.
   (c) Compare between tailoring and industrial system of apparel manufacturing.
   [2+5+5=12]

2. (a) What is meant by standard body measurement? Write the measurement chart of a adult men's.
   (b) Define Pattern grading. How is it done?
   (c) Differentiate between basic block and working pattern.
   [5+4+3=12]

3. (a) Define: a) Blind stitch, b) Basic block c) Approved sample
   (b) Write down the constraints of marker making with explanation.
   (c) What are the methods of duplicating marker?
   [3+5+4=12]

4. (a) Explain the requirements of fabric spreading in details.
   (b) Briefly describe about the factors affecting marker efficiency.
   (c) What are the types of fabric packages uses in our industry, explain them in details.
   [5+3+4=12]

Part : B
(Answer any three questions)

5. (a) Define strike through and strike back.
   (b) Compare between lining and interlining.
   (c) State the features of straight knife with advantages and disadvantages.
   [2+4+6=12]

6. (a) Draw an "Inspection loop" and explain.
   (b) Discuss "Four point system" for fabric inspection.
   (c) Write the quality of trimmings.
   [4+4+4=12]

7. (a) What is AQL? Write down the procedure of final inspection for apparel industry based on AQL.
   (b) Describe the requirements of fabric cutting.
   (c) Write short note on (i) Motif and (ii) Swatch card.
   [5+3+4=12]

8. (a) Write down the features & applications area of seam class-2 and seam class-6 with neat sketch.
   (b) Differentiate between lock stitch and chain stitch.
   (c) What is Label? Describe various functional label uses in Bangladesh's Apparel Industry?
   [5+3+4=12]

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BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-2 Term-I, Final Examination-2018

Subject: Apparel Production-I (Code: AE 201)

Time: 3.0 Hrs. **Full Marks: 72**

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A
(Answer any three questions)

1. (a) Define standard body measurement.
   (b) How to measure a basic T-shirt?
   (c) Show the sequence of apparel manufacturing.
   (d) Discuss about the flat method and modeling method for pattern making.
   [2+3+2+5=12]

2. (a) What is marker efficiency?
   (b) Mention the factors that affect marker length.
   (c) List down same constraints of marker making.
   (d) Describe the causes of the fabric wastage outside the marker.
   [2+2+3+5=12]

3. (a) Define fabric spreading with its objects.
   (b) Describe the basic requirements of fabric spreading.
   (c) Briefly discuss on the types of fabric lays.
   [3+5+4=12]

4. (a) Write down the objectives of fabric cutting.
   (b) What are the reasons of fused edge in cutting process.
   (c) Describe the working principle of straight knife cutting machine with sketch.
   (d) Describe laser beam and plasma torch for fabric cutting.
   [2+2+4+4=12]

Part : B
(Answer any three questions)

5. (a) Define trimmings and accessories.
   (b) Why lining is used in garment industry?
   (c) Write short note on:
   (i) Swatch card (ii) Velcro tape (iii) Wadding (iv) Care label code
   2+2+8=12[]

6. (a) Classify interlining and shortly discuss on it.
   (b) Distinguish between fusible and sewn interlining.
   (c) How can you control the temperature of fusing machine for quality fusing.
   [4+4+4=12]

7. (a) Define sewability of sewing thread.
   (b) Write about core spun sewing thread.
   (c) List down same names of sewing thread packages used in apparel industry.
   (d) Mention the factors that affect function of a sewing thread.
   [2+2+2+6=12]

8. (a) How will you control the quality during fusing. Discuss briefly.
   (b) Differentiate between label and motive.
   (c) Discuss about quality of trimmings.
   [5+3+4=12]

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BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-2 Term-I, Final Examination-2018

Subject: Fundamentals of Marketing (Code: TEM 201)

Time: 3.0 Hrs. **Full Marks: 72**

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A
(Answer any three questions)

1. (a) What is understand by "Marketing"?
   (b) Explain the core marketing concepts.
   (c) What are the basic functions of marketing? **[2+5+5=12]**

2. (a) "Marketing determines the standard of living". Explain this statement.
   (b) Discuss the philosophy of marketing management.
   (c) Show the basic differences between micro and macro environment. **[4+5+3=12]**

3. (a) Explain the concept of market segmentation with an example.
   (b) Narrate the market positioning and targeting with an example.
   (c) Discuss the buyer behavior model. **[4+4+4=12]**

4. (a) Define product and service. Discuss the characteristics of goods and services.
   (b) Discuss the classifications of product with an example.
   (c) What is meant by product life cycle? Discuss the different steps of product life cycle. **[3+5+4=12]**

Part : B
(Answer any three questions)

5. (a) Define brand and label.
   (b) Describe major types of retail organizations.
   (c) Do you support to evict wholesaler from distribution channel? Defend your answer. **[2+6+4=12]**

6. (a) What is meant by price?
   (b) Discuss the objectives of pricing.
   (c) Discuss the major decisions of advertising. **[2+4+6=12]**

7. (a) "Customer is the king of market". Explain the concept.
   (b) How will you attract or retain the customer of your factory?
   (c) Describe the differences between demands and wants. **[4+4+4=12]**

8. (a) Write down the short notes with an example on the followings (any four):-
   (i) Market environment
   (ii) Culture and social group
   (iii) Marketing for society
   (iv) Branding
   (v) Packaging
   (vi) Logistics management. **[3 × 4=12]**

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BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)

Level-2 Term-I, Final Examination-2018

Subject: Fundamentals of Electrical & Electronics Engineering (MDM 201)

Time: 3.0 Hrs. **Full Marks: 72**

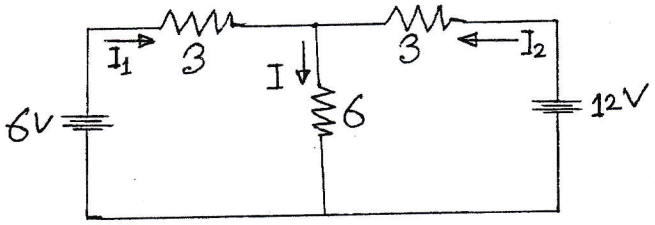
(Use separate answer script for Part: A and Part: B)

(All parts of a question must be answered consecutively)

Part: A

(Answer any three questions)

1. (a) State and explain the Ohm's law with necessary diagram.
   (b) Explain Thevenin's theorem with diagram.
   (c) Find the different current flowing in the branch of figure using superposition theorem. All resistance is Ohm.



[3+4+5=12]

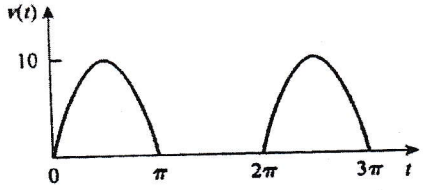
2. (a) What is sub-station? List the major equipment of substation.
   (b) Define earthing and write down the importance of earthing.
   (c) Describe the basic principle of AC voltage generation in a generator.

[3+4+5=12]

3. (a) The voltage across a load is $v(t) = 60Cos(\omega t - 10°)V$ and the current through the element in the direction of the voltage drop is $i(t) = 1.5Cos(\omega t + 50°)A$. Find the complex power, the power factor and the load impedance.
   (b) Why the Δ-connected load is more desirable than Y-connected load?
   (c) Derive the equations of the alternating voltages.

[5+3+4=12]

4. (a) Write down the steps of nodal analysis and mesh analysis.
   (b) Determine the value of form factor of the current waveform depicted below.



   (c) Show that a resistive load absorbs power at all times, while a reactive load absorbs zero average power.

[4+3+5=12]

Part: B

(Answer any three questions)

5. (a) Explain the operation of a full wave bridge rectifier.
   (b) How can you minimize the hysteresis loss and eddy current loss?
   (c) Derive the expression for force on a current carrying conductor lying in a magnetic field.

[4+4+4=12]

6. (a) Explain the difference between sensor and transducer.
   (b) Write short notes on: (i) break down voltage and (ii) peak inverse voltage.
   (c) Show that the instantaneous power supplied by the balanced three phase system is constant.

[3+3+6=12]

7. (a) Write down the properties of semiconductor.
   (b) What is doping? Briefly explain p-type semiconductor.
   (c) Describe V-I characteristics curve of forward and reverse biased p-n junction.

[3+4+5=12]

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-2 Term-I, Final Examination-2018

Subject: Wet Processing-I (Code: WPE 205)

Time: 3.0 Hrs. **Full Marks: 72**

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A
(Answer any three questions)

1. (a) Give a general flowchart of textile wet processing.
   (b) Point out the consequences of using hard water in wet processing.
   (c) "Hard water causes the wastage of soap". Do you agree with this statement? Defend your answer with necessary reaction.
   (d) Illustrate a modern industrial water softening process.

[2+3+3+4=12]

2. (a) Mention the raw materials used for soap manufacturing.
   (b) Distinguish between detergent and soap.
   (c) Explain the changes occur on cotton fibre during scouring process.
   (d) Describe the scouring of fabric in J-Box with sketch.

[2+3+3+4=12]

3. (a) Define singeing. Write down the important parameters of gas singeing.
   (b) Discuss Bio-Polishing with typical recipe.
   (c) Why desizing is done? Write short note on TEGEWA rating.

[4+4+4=12]

4. (a) Why H_2O_2 is called universal bleaching agent? Name the pigment responsible for natural color of cotton.
   (b) What is permanent hardness? Explain the bleaching action of H_2O_2.
   (c) Discuss on "mechanism of detergency" shortly.
   (d) Detergent or soap which one is better for textile application, why?

[3+4+3+2=12]

Part : B
(Answer any three questions)

5. (a) What is colour? Describe the additive and subtractive colour theory.
   (b) Describe the general concept of dyeing.
   (c) Differentiate between dyestuff and pigments.

[4+5+3=12]

6. (a) Illustrate typical structure of reactive dyes.
   (b) Classify reactive dye on the basis of application.
   (c) Explain discontinuous process of dyeing cotton fabric with reactive dye.
   (d) How fastness property of direct dye can be improved?

[2+3+4+3=12]

7. (a) Write short note on i) Substantivity ii) Exhaustion iii) Topping iv) Desorption.
   (b) Differentiate between dyes and pigments.
   (c) Define chromophore? Write the chemical structure of azo, anthraquinone, nitroso, indigoid.
   (d) Through light on "pick up percent".

[4+3+3+2=12]

8. (a) Discuss the chemistry of dyeing with sulphur dyes on cotton fabric.
   (b) Give an example of a colorant which can be used for all types of fiber and write short note on it.
   (c) Describe the stripping process of reactive dyed fabric with recipe.
   (d) What is color fastness?

BANGLADESH UNIVERSITY OF TEXTILES

B. Sc. in Textile Engineering (For Affiliated College)
Level-2 Term-I, Final Examination-2018

Subject: Textile Physics (Code: YE 209)

Time: 3.0 Hrs. **Full Marks: 72**

(Use separate answer script for Part: A and Part: B)
(All parts of a question must be answered consecutively)

Part: A
(Answer any three questions)

1. (a) Write down the methods for investigation of fiber structure.
   (b) Illustrate the measurement technique of static charge in textile material.
   (c) How can you investigate the structure of a fiber by X-ray diffraction method?
   [2+5+5=12]

2. (a) Define torsional rigidity and flexural rigidity.
   (b) Differentiate between CRE and CRL method for tensile experiment.
   (c) Show that, flexural rigidity $= \frac{1}{4\pi}\frac{\eta EsC2}{\rho}$, where η = Shape factor, Es = Specific modulus, ρ = Density.
   (d) Find out the breaking twist angle of cotton fiber, where dia of cotton fiber is 0.017 mm and breaking twist per inch is 60.
   [2+3+5+2=12]

3. (a) Why synthetic dresses are not suitable in summer or winter season.
   (b) What is glass transition temperature? Write the factor that influence the value of glass transition temperature.
   (c) Prove that, Specific torsional rigidity $= \frac{\eta\epsilon}{\rho}$, where η = specific modulus, ϵ = shape factor and ρ = density of fiber.
   [2+4+6=12]

4. (a) Write the importance of swelling.
   (b) Prove that, $S_V = S_L+S_A+S_LS_A$. Where S_V, S_L and S_A indicates the usual meaning.
   (c) Define lusture. Describe the factors which affects on lusture.
   [3+4+5=12]

Part : B
(Answer any three questions)

5. (a) What is friction and co-efficient of friction?
   (b) Describe the methods available for determining co-efficient of friction.
   (c) Describe the effects of lubricant on frictional force.
   [2+6+4=12]

6. (a) Explain the factors that are responsible for luster of textile fiber.
   (b) Differentiate between warp and weft jamming.
   (c) Explain the causes of double refraction in textile fiber.
   (d) Find relationship among refractive index, density, and swelling of fiber.
   [2+2+4+4=12]

7. (a) What is schwarz's correction?
   (b) Write the assumption of ideal yarn structure.
   (c) Write the basic geometry of twisted yarn.
   [3+3+6=12]

8. (a) Describe riding's experiment for measurement of migration.
   (b) When filling thread is straight, Prove that $\iota 1 = D\theta 1 + Dcot\theta 1$.
   (c) Fabric specification $\frac{20\times30}{70\times64}$, Crimp of Warp and Weft is 6% and 5%.