

# BANGLADESH UNIVERSITY OF TEXTILES

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

Level-2 Term-I, Final Examination-2018

Subject: Yarn Manufacturing-I (Code: YE 213)

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 properties of cotton fibre which are considered for cotton spinning.  
(b) Write the process flow chart of combed yarn with output and input.  
(c) What are the advantages of chute feeding?  
(d) Describe the faults of blow-room occurred during cotton processing. [2+3+3+4=12]
2. (a) What is bale management? Why it is important?  
(b) Show the modern blow room line of RIETER.  
(c) Describe the basic operations in blow room.  
(d) What is cleaning efficiency? Write the functions of grid bar. [2+2+4+4=12]
3. (a) Why carding machine is called the heart of spinning?  
(b) Discuss the actions between the different parts of a carding machine.  
(c) What is NRE%? How we calculate the NRE%?  
(d) Find actual draft of a high speed carding machine for mechanical draft = 86, waste extraction = 7%, and lap hank is 0.0012. [2+4+2+4=12]
4. (a) What are the functions of draw frame?  
(b) Discuss the effect of doubling and drafting on sliver quality.  
(c) Describe the modern drafting systems used in cotton draw frame.  
(d) Define roller setting and describe the basic principle of roller drafting. [2+2+4+4=12]

## Part : B

(Answer any three questions)

5. (a) Define degree of combing.  
(b) Classify combing according to the degree of combing.  
(c) Describe lap preparation for comber using super lap former.  
(d) Find out the production per day of a comber from the given data: feed/ nip = 6.7 mm, nips/ min = 120, no. of heads = 6, noil% = 16%, lap feed = 68 Ktex, efficiency = 90%. [2+2+4+4=12]
6. (a) Define twist.  
(b) Why speed frame is used for short staple spinning?  
(c) Describe the operation cycles of combing with figure.  
(d) Write down the uses of false twist. [2+2+6+2=12]
7. (a) Explain the necessity of speed frame in cotton spinning system.  
(b) Show that, for bobbin leading winding principle of a speed frame:  $N_B \propto \frac{1}{D}$ . Where,  $N_B$  = Bobbin speed and  $D$  = Bobbin diameter.  
(c) What are the functions of building motion in speed frame?  
(d) Al-Haj Karim spinning mills ltd. is running a speed frame with the following parameters: Flyer r.p.m = 1200, no. of flyer = 120, roving hank = 0.85,  $TM = 1.5$ , efficiency = 85%, Then, calculate their production in lbs/ day. [2+3+3+4=12]
8. (a) Why ring spinning is universal spinning system?  
(b) Sketch a modern drafting system used in ring frame.  
(c) What is traveler? Mention the factors those influence the selection of a traveler.

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**BANGLADESH UNIVERSITY OF TEXTILES**

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

**Level-2 Term-I, Final Examination-2018**

**Subject: Fabric Manufacturing-I (Code: FE 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 meant by winding?  
(b) Distinguish between precision and non-precision winding.  
(c) Write the working principle of cone winding machine. [2+4+6=12]
  
2. (a) Discuss about the yarn guides that are used in winding.  
(b) What are the technological changes happened due to sizing?  
(c) A Warper's beam produced on an improved modern high speed warping machine contains 40000 yds. of warp with 750 ends. If the net weight of the warp on the beam is 680 lbs, calculate the yarn count. [4+4+4=12]
  
3. (a) What is meant by warping?  
(b) Describe the sectional warping machine.  
(c) Show the warping plan if a fabric construction is  $\frac{70 \times 70}{30 \times 30} \times 72''$ . [2+5+5=12]
  
4. (a) Write the function of the size ingredients used in cotton yarn sizing.  
(b) Narrate different types of sizing techniques.  
(c) A warp beam containing 5400 ends is required to be sized to 15 %. The length of the sized warp on the beam is required to be 1650 yds. If the count of the yarn is 30 Ne, then calculate the followings:  
(i) weight of the size to be put on the warp of the given length.  
(ii) weight of sized warp.  
(iii) count of sized warp. [3+6+3=12]

**Part : B**

**(Answer any three questions)**

5. (a) Is it possible to produce woven fabric without primary motions? Mention your opinion.  
(b) Differentiate between 'Over picking' and 'Under picking' mechanism.  
(c) Define shedding. Illustrate bottom close shed with its principle. [4+4+4=12]
  
6. (a) What is meant by shed?  
(b) Describe the types of shed.  
(c) Illustrate the basic working principle of Double Lift Single Cylinder (DLSC) jacquard shedding mechanism. [1+5+6=12]
  
7. (a) Describe hook and knife dobby shedding mechanism with appropriate sketch.  
(b) Classify different types of harness mounting.  
(c) Differentiate among 5-wheel and 7-wheel take up mechanism. [6+2+4=12]
  
8. (a) Write down the features of modern loom.  
(b) Briefly discuss on air jet loom.  
(c) Write the definition and purposes of fabric selvedge.  
(d) Write the short notes on denim weaving. [4+3+(1+1)+3=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: Wet Preparatory Process (Code: WPE 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) Write down the flow chart of wet preparatory process of woven fabric with short description.  
(b) What are the impurities present in cellulosic fibre and how can we remove these?  
(c) Why pretreatment is necessary before coloration of textile good? Briefly describe.  
[6+3+3=12]
2. (a) Write down the objects of scouring.  
(b) Describe a cotton goods scouring process with a suitable recipe and process curve.  
(c) Draw the schematic diagram of a Kier boiler with different parts and describe its function.  
[2+5+5=12]
3. (a) Why singeing is done in woven fabric?  
(b) Describe a gas singeing machine with the help of suitable sketch.  
(c) Write down the controlling factors of gas singeing process.  
(d) How can you assess the effectiveness of singeing?  
[2+5+2+3=12]
4. (a) Mention the factors, on which the efficiency of size removal depends.  
(b) Describe an enzymatic desizing of cotton fabric with suitable recipe and process parameters.  
(c) Mention the advantages and disadvantages of root steeping method.  
[3+5+4=12]

**Part : B**

**(Answer any three questions)**

5. (a) Write down the importance of mercerization.  
(b) Discuss the factors affecting on mercerizing process.  
(c) Discuss the morphological changes of cotton fibre due to mercerization.  
(d) What are the types of mercerization?  
[2+3+5+2=12]
6. (a) What are the impurities present in silk and wool fibre?  
(b) Describe the silk degumming process with a suitable recipe and process curve.  
(c) Discuss the faults and remedies of scouring process.  
[2+5+5=12]
7. (a) Define bleaching process.  
(b) What are the factors affecting hypochlorite bleaching?  
(c) Explain the bleaching mechanism of hydrogen peroxide.  
(d) Discuss about the bleaching process of polyester/cotton blended fabric.  
[2+3+3+4=12]
8. (a) Compare between bio-scouring and alkali scouring.  
(b) Write short note on solvent scouring.  
(c) What is bleaching agent? Classify bleaching agents.  
[4+4+(1+3)=12]

**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 short staple and extra-long staple.  
(b) State the fiber properties that are considerable for spinners. Briefly describe the fiber fineness property.  
(c) What should be the cotton fiber parameters for producing 30/1 Ne yarn?  
(d) What do you understand by 3.9 MIC value? Write down the process flow chart of combed yarn. [2+4+2+4=12]
2. (a) Define bale management. State the necessity of bale management.  
(b) Point out the advantages of modern blowroom.  
(c) Summarize grid bar and its type. Mention its role on cotton processing.  
(d) Explain how to extract foreign fiber from cotton fiber at blowroom line. [(1+2)+3+3+3=12]
3. (a) Write down the standard sequence of machine in the blow room for producing blended yarn (cotton and viscose).  
(b) What is grid bar? Describe the elements and adjustment of grid bar.  
(c) Production per hour from 3-scutchers of a blow room line is 300 lbs, waste % of blow room is 6%. Calculate the no. of bales to be fed in given blow room per month provided that one bale is 165 kg (25 working days/ month).  
(d) Find the blow room cleaning efficiency, if waste in raw cotton = 6.5%, waste in sliver = 0.3%. Carding, cleaning efficiency 80%. [3+4+3+2=12]
4. (a) Describe the working principle of Rieter B12 unclean machine.  
(b) Write short note on magnetic metal extractor used in blowroom line for metal extraction.  
(c) 120 yds weigh 2.26 gm. Compute linear density in Ne & Tex. [4+4+4=12]

**Part: B****(Answer any three questions)**

5. (a) Define carding. Mention the objective of carding machine.  
(b) Illustrate carding, stripping, doffing, and combing action.  
(c) Recall card clothing. Label the different types of card clothing. [(1+2)+6+(1+2)=12]
6. (a) How card sliver quality can be assessed?  
(b) Demonstrate the working principle of revolving flat carding machine with figure.  
(c) A modern spinning mill has 20 carding machines. It runs 3 shift/day. Find out the production per week in kg from the following data: Delivery speed = 200 m/min, sliver count = 0.11 Ne, waste = 3%, efficiency = 95%. [(1+2)+5+4=12]
7. (a) "Draw frame has a considerable influence on yarn evenness"- briefly describe your opinion for this statement.  
(b) Describe the suction system of the drafting arrangement with appropriate figure.  
(c) State the characteristics of drawn sliver.  
(d) A draw frame with 1.25 inch diameter front roller and running at 400 rpm suffers 18% stoppages while delivery 0.15 hank sliver. Find out the actual production per delivery per shift of 8 hours. [3+4+2+3=12]
8. (a) What is understood by "Equalizing"? How equalizing is performed in draw frame.  
(b) What are the requirements of drafting arrangement? How cotton and synthetics are blended in draw frame?  
(c) Find out the production per shift in lbs of a modern draw frame from the following particulars: Delivery speed = 650 m/min, no. of delivery/ frame = 2, draft = 8, no. of doublings

# BANGLADESH UNIVERSITY OF TEXTILES

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

Level-2 Term-I, Final Examination-2018

Subject: Weaving Preparatory Process (Code: FE 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) Write the process flow chart of weaving.  
(b) Briefly describe the factors that influence the winding efficiency.  
(c) Explain the necessity of tapered drum in sectional warping. [4+5+3=12]
  
2. (a) Write the feature of precision winding.  
(b) Describe about various types of Tension device.  
(c) The winding drum of a high speed cone winder having a diameter of 3 inch makes 2870 rpm. The actual amount of yarn wound in 9 hrs was found to be 332838 yds. Calculate the efficiency. [3+6+3=12]
  
3. (a) What is warping? Classify warping.  
(b) Illustrate different types of creels used in warping.  
(c) A sectional warping machine has 544 creel capacity. A color beam having total warp of 5400 has to be produced by this machine having the following pattern. Red=120, blue=60, white=30 and yellow=30. Find out the following: (i) No. of repeat/section.  
(ii) Total No. of sections. (iii) If the beam width is 60" also find out the section width. [4+5+3=12]
  
4. (a) Write the functions of components of creel and headstock.  
(b) Distinguish between Direct and Sectional warping.  
(c) Calculate the time required to prepare of 8 warper beam on 2 improved modern high speed beam warpers with warping speed of 560 yds per min. The length of warp on each beam is required to be 36,000 yds. Efficiency 80%. [5+4+3=12]

## Part : B

(Answer any three questions)

5. (a) What are the size ingredients used in cotton yarn sizing? Mention their functions.  
(b) Narrate different kinds of sizing techniques.  
(c) A warp beam containing 5500 ends is required to be sized to 15%. The length of the sized warp on the beam is required to be 2500 yds. If the count of the yarn is 30 Ne, then calculate the followings: (i) The weight of the size to be put on the warp of the given length. (ii) The weight of sized warp. (iii) The count of sized warp. [3+6+3=12]
  
6. (a) Explain the relation between Taper angle and amount of yarn.  
(b) Write the working procedure of sectional warping m/c.  
(c) Write the name of warper beam defects. [5+5+2=12]
  
7. (a) Describe the technological changes due to sizing.  
(b) Draw a sizing weaving curve and show the relation between size take-up percentage and weaving efficiency.  
(c) Write down different types of drying system used in sizing.  
(d) What are the advantages of multi Cylinder drying? [4+4+2+2=12]
  
8. (a) Briefly Describe the Basic principle of weaving.  
(b) Discuss about different Loom motion.  
(c) Fabric specification  $\frac{9 \times 9}{75 \times 60} \times 1.43m$  calculate the fabric weight in kg of 1000 yds.

# BANGLADESH UNIVERSITY OF TEXTILES

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

Level-2 Term-I, Final Examination-2018

Subject: Man-Made Textile Fibres (Code: YE 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) What is texturisation? Mention different types of spin finishes and their properties?  
(b) Briefly explain dry spinning process with appropriate illustration.  
(c) Write down the factors influencing the chemical structure of fibre forming polymers.  
[4+5+3=12]
2. (a) Write down the chemical structure and end uses of triacetate and acetate fibre.  
(b) Illustrate the flow chart of acetate fibre manufacturing process.  
(c) Describe the features and extraction processes of bamboo fibre.  
[4+4+4=12]
3. (a) Prove viscose rayon is a regenerated fibre with necessary reaction.  
(b) Describe the steps of viscose rayon production process.  
(c) Write the application of rayon fibre.  
[3+7+2=12]
4. (a) What is cellulose ester fibre? Write the characteristics of it?  
(b) Mention the raw materials and chemical used in acetate fibre production. Also write the reaction occurred to produce acetate fibre.  
(c) Discuss the effects of chemical on acetate fibre.  
[[3+6+3=12]

## Part : B

(Answer any three questions)

5. (a) What is polyamide? Classify it with example.  
(b) How nylon salt is prepared? Describe the manufacturing process of nylon 6,6 .  
(c) Distinguish between nylon and aramid fibre.  
[2+7+3=12]
6. (a) Write the features of polyester fibre.  
(b) How can you produce PET monomer and PET polymer?  
(c) Briefly describe the physical properties of polyester fibre.  
(d) Mention some trade name of PET fibre which found in the market.  
[2+5+3+2=12]
7. (a) Distinguish between acrylic and modacrylic fibre.  
(b) Sketch the polymerization and spinning process of acrylic fibre with proper identification.  
(c) Classify carbon fibre on the basis of modulus. State some applications of carbon fibres. Clarify the reasons behind high tensile strength of glass fibre.  
[2+5+5=12]
8. (a) "Gel spinning process is most appropriate for spinning ultra high molecular weight polyethylene fibre"- justify the statement.  
(b) What do you mean by high performance fibres? Give some of their important characteristics and industrial application areas.  
(c) Write short note on: (i) LDPE (ii) Kevlar (iii) E-glass.  
[3+3+(3×2)=12]

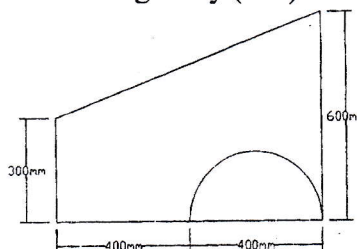
**(Use separate answer script for Part: A and Part: B)**  
**(All parts of a question must be answered consecutively)**

**Part: A****(Answer any three questions)**

1. (a) What is boiler accessories and boiler mounting? Write the name of boiler accessories and mountings.  
 (b) Write differences between 4 stroke and 2 stroke engine.  
 (c) What is the internal combustion engine? Briefly describe different parts of internal combustion engine?  
[4+3+5=12]
2. (a) Explain Newton's law of viscosity. Draw deformation vs stress graph and explain its nature.  
 (b) Derive Bernoulli's equation and list all necessary assumptions.  
 (c) Write short notes on: Venturi meter, Surface tension, Kinematic viscosity.  
[4+4+4=12]
3. (a) Derive an expression for Bernoulli's Equation with Assumptions.  
 (b) A pipe of 300 m long has a slope of 1 in 100 and tapers from 1 m diameter at the higher end and 0.5 m at the lower end. The quantity of water flowing is 900 lt/s, if the pressure at the higher end is 70 KPa, find the pressure at the lower end.  
[6+6=12]
4. (a) Write significance of bending moment diagram of the beam.  
 (b) For deformation of the body, due to self-weight prove that  $\delta = \frac{Wl}{2AE}$ .  
 (c) Draw bending moment and shear force diagram of a beam when both point load and uniformly distributed loads are acted together on simply supported and cantilever beam. Assume the position of point load on the middle of the beam.  
[3+3+6=12]

**Part: B****(Answer any three questions)**

5. (a) Show that the maximum shear stress induced in the solid shaft is equal to  $\frac{16T}{\pi D^3}$   
 (b) From following figure find out Center of gravity (CG).



- [6+6=12]
6. (a) Describe the classification of cam follower.  
 (b) Find the power transmitted by a belt running over a pulley of 600 mm diameter at 200 RPM. The coefficient of friction between the belt and the pulley is 0.25, angle of lap  $160^\circ$  and maximum tension in the belt is 2500 N.  
 (c) Describe the different types of gear train with neat sketch.  
[4+4+4=12]
  7. (a) Define adiabatic process. Derive the expression of work done, change in enthalpy, heat supplied for an adiabatic process.  
 (b) State First Law, Second Law & Third law of thermodynamics. Show that first law of thermodynamics is the law of conservation of energy.  
 (c) Define mounting and accessories. List five mountings & five accessories of boiler.  
[4+5+3=12]
  8. (a) Prove that the longitudinal stress is half of the hoop stress.  
 (b) A cylindrical shell of 1.3 m diameter is made up of 18 mm thick plates. Find the hoop stress

# BANGLADESH UNIVERSITY OF TEXTILES

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

Subject: Fiber and Yarn Testing (Code: YE 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 meant by quality control? Write the modern concept of quality control.  
(b) Why conditioning of textile material is required before testing?  
(c) Mention the factors by which the sampling methods are governed to a large extent.  
(d) Describe a suitable sampling technique for cotton fibre sampling. [3+2+3+4=12]
2. (a) "Strength of yarn depends on fiber maturity". Explain.  
(b) Mention the importance of fiber fineness.  
(c) Prove that Maturity ratio,  $M = \frac{N - D}{200} + 0.7$ , where N= no. of normal fibers and D= no. of dead fibers.  
(d) Define "micronire value". [3+3+4+2=12]
3. (a) Explain the effects of moisture on textile materials.  
(b) Why correct invoice weight is necessary in case of textile?  
(c) State the standard moisture regain of Cotton, Silk, Nylon, Polyester, and Wool.  
(d) Describe the procedure of measuring trash% by Shirley trash analyzer. [2+2+3+5=12]
4. (a) What is meant by 2.5% Span length and Uniformity Ratio?  
(b) Why span length measurement is more realistic than comb sorter analysis?  
(c) Describe the AFIS method of counting maturity ratio. [4+3+5=12]

## Part : B (Answer any three questions)

5. (a) Define Tex, Metric Count, and Worsted Count.  
(b) Write a short note on "Hysteresis effect".  
(c) A three ply yarn is composed of one thread of 56 worsted, one thread of 48 worsted and one thread of 2/80 cotton. What is the count of resultant yarn?  
(d) Prove that yarn dia,  $d = \frac{0.375}{100} \sqrt{\text{tex}}$  cm. [3+2+3+4=12]
6. (a) What is yarn count? Explain the following 28 Ne, 30 deci tex, and 10 lbs /spindle.  
(b) Write the relation between Denier & English cotton count system.  
(c) Describe the instrument for determination of yarn count from a small piece of fabric.  
(d) A double yarn is produced from 60 Ne single yarn & the resultant count 15 Ne. Now find out the no of single yarn. [3+3+4+2=12]
7. (a) What is 'Z' twist? Describe influence of twist on yarn.  
(b) What is twist factor? Show the relation between  $T.P.I = K\sqrt{\text{count}}$ .  
(c) Explain in briefly twist contraction.  
(d) Differentiate between optical & capacitance principle. [3+4+2+3=12]
8. (a) What is index of irregularity?  
(b) Write the causes of yarn Irregularities.  
(c) Describe Uster evenness tester with working principle.