Name : .....

Roll No. : .....

Invigilator's Signature : .....

CS/B.Tech(APM-N)/SEM-3/APM-301/2011-12

2011

BASICS OF MECHANICAL PROCESSING OF TEXTILES

Time Allotted : 3 Hours *Full Marks* : 70

The figures in the margin indicate full marks.

Candidates are required to give their answers in their own words as far as practicable.

Graph sheet(s) will be supplied by the institution on demand.

GROUP – A
(Objective Type Questions)

1. Answer the following questions : 10 × 1 = 10

A) Match the columns (Choose the most suitable from **Column - II** against the terms given in the **Column - I** :

i)

	Column - I		**Column - II**
1)	Stiffness of fabric	a)	Table cloth, hand towel
2)	Huckabck	b)	Cover factor
3)	Air permeability	c)	Picking
4)	Dwell	d)	Bending length.

B) Choose the correct alternatives for the following :

ii) Minimum number of heald shafts required to construct a $\frac{3}{2}$ twill is

a) 2 b) 3

c) 4 d) 5.

iii) Which of the following move numbers can be used to construct a 10-end satin structure ?

a) 2, 3 and 5 b) 3 and 5

c) 1, 6 and 7 d) 3 and 7.

iv) Which of the following fabrics usually possesses minimum drape coefficient ?

a) Trouser fabric

b) Shirting fabric

c) Fabric for ladies gown

d) Bed sheet fabric.

v) "Usually knitted fabrics are preferred over wovens for making sportswear." Choose the most appropriate reason for the quoted statement :

a) Due to higher elasticity

b) Due to higher strength

c) Due to higher abrasion resistance

d) Due to higher air permeability.

vi) Which of the following fibres is mostly used in making of fine quality suiting apparels ?

a) Silk b) Flax

c) Wool d) Cotton.

vii) Aspect ratio of a textile fibre indicates which of the following ?

a) length/count b) diameter/length

c) length/diameter d) count/diameter.

viii) The prime objective of cotton combing process in combed yarn preparation is

a) to remove short fibres

b) to remove impurities

c) to remove long fibres

d) to make combed sliver.

ix) Which of the following processes is omitted for making of open-end rotor spun yarn ?

a) Carding b) Roving

c) Drawing d) Winding.

x) The count of the component yarns of a woven fabric can be directly measured by using

a) air-flow method b) gravimetric method

c) Beesley balance d) microbalance.

GROUP – B
(Short Answer Type Questions)

Answer any *three* of the following. 3 × 5 = 15

2. a) Draw the structure, drafting plan and peg plan for a 14 end Huckaback design. Use suitable graph sheet.

   b) Mention the applications of Huckaback structure. 4 + 1

3. Draw a schematic diagram to illustrate shedding mechanism in a tappet loom and identify the following :

   i) Heald eye

   ii) Reed

   iii) Cloth fell position.

4. a) Explain why it is not possible to draw a 8-end stain structure with the move number as 6. Use point paper design to justify your answer.

   b) Calculate production efficiency of a loom with 300 average RPM with a construction of 96 EPC × 60 PPC (loomstate), if average production per shift of 450 available minute = 15 metre running length. 3 + 2

5. Name two vegetable fibres used in making of apparels. Mention their typical characteristics (at least four), common for both, related to suitability for apparel applications. 1 + 4

6. What is conversion constant and conversion factor regarding count of textile fibre ? Determine the denier of a fibre having fineness of 5·18 microgram/inch stating the value of conversion constant or conversion factor. 2 + 3

7. What are the different types of yarns available for apparel applications ? Is the sewing thread be placed in one of the category of yarn ? How is a sewing thread specified ? Explain with examples. 2 + 1 + 2

GROUP – C
(Long Answer Type Questions)

Answer any *three* of the following. 3 × 15 = 45

8. a) Mention construction details, special features and end uses for the following fabrics :

   i) Cambric fabric

   ii) Poplin fabric

   iii) Denim fabric.

   b) Give the classification of loom according to picking mechanism. 12 + 3

9. a) Derive the mathematical expression of cloth cover factor of woven fabric.

   b) Describe a suitable test method of determining drape of a fabric. Derive mathematical expression of drape coefficient.

   c) What do you mean by seam slippage ? Explain in brief how tailorability of a woven fabric can be assessed.

   3 + 7 + 5

10. a) Mention the difference between tearing strength and tensile strength of fabric.

    b) Draw the design, drawing and lifting plan for a Herringbone structure on 2/2 twill base.

    c) Make a comparison of the basic mechanical properties of knitted and woven structure. Give reasons in brief to justify the difference in mechanical properties of knitted and woven fabric.

    d) Mention the basic constructional parameters of a Warp knitted fabric.

    e) Describe a test method in brief to determine Garment shrinkage. 2 + 3 + 4 + 2 + 4

11. Prepare a comprehensive classification of organic textile fibres by source with examples. Mention any four fibres, two each from protein based and petroleum based, used in different sectors of apparel production. Compare their important properties and end-uses. Mention any apparel application of inorganic fibres. 5 + 2 + 6 + 2

12. a) Briefly mention the objectives of the processes involved in yarn preparation stage for making carded cotton yarns.

    b) Compare the structural characteristics and end-uses of rotor spun, air-jet spun and friction spun yarns.

    c) A 30s Ne cotton yarn is plied with a 20 tex cotton yarn. Find out the weight of the 10 km resultant yarns.

6 + 5 + 4

13. a) Name different objective yarn properties to be necessary for testing to prepare quality apparels. Also mention the name of the testing instruments and units of those parameters.

    b) Illustrate the process sequence of sewing thread making and primary characteristics of sewing threads.

    c) Discuss the role of different fibres commonly used in making of sewing threads. 4 + 6 + 5