FABRIC STRUCTURE AND TEXTILE TESTING (SEMESTER - 4)

CS/B.Tech (APM)/SEM-4/APM-402/09

1. .....
Signature of Invigilator

2. .....
Signature of the Officer-in-Charge

Reg. No.

Roll No. of the Candidate

CS/B.Tech (APM)/SEM-4/APM-402/09

ENGINEERING & MANAGEMENT EXAMINATIONS, JUNE – 2009

FABRIC STRUCTURE AND TEXTILE TESTING (SEMESTER - 4)

Time : 3 Hours] [Full Marks : 70

INSTRUCTIONS TO THE CANDIDATES :

1. This Booklet is a Question-cum-Answer Booklet. The Booklet consists of **32 pages**. The questions of this concerned subject commence from Page No. 3.
2. a) In **Group – A**, Questions are of Multiple Choice type. You have to write the correct choice in the box provided **against each question**.
   b) For **Groups – B** & **C** you have to answer the questions in the space provided marked 'Answer Sheet'. Questions of **Group – B** are Short answer type. Questions of **Group – C** are Long answer type. Write on both sides of the paper.
3. **Fill in your Roll No. in the box** provided as in your Admit Card before answering the questions.
4. Read the instructions given inside carefully before answering.
5. You should not forget to write the corresponding question numbers while answering.
6. Do not write your name or put any special mark in the booklet that may disclose your identity, which will render you liable to disqualification. Any candidate found copying will be subject to Disciplinary Action under the relevant rules.
7. **Use of Mobile Phone and Programmable Calculator is totally prohibited in the examination hall.**
8. You should return the booklet to the invigilator at the end of the examination and should not take any page of this booklet with you outside the examination hall, **which will lead to disqualification**.
9. Rough work, if necessary is to be done in this booklet only and cross it through.

No additional sheets are to be used and no loose paper will be provided

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FOR OFFICE USE / EVALUATION ONLY

Marks Obtained

	Group – A										Group – B			Group – C				
Question Number																	***Total Marks***	***Examiner's Signature***
Marks Obtained																		

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Head-Examiner/Co-Ordinator/Scrutineer

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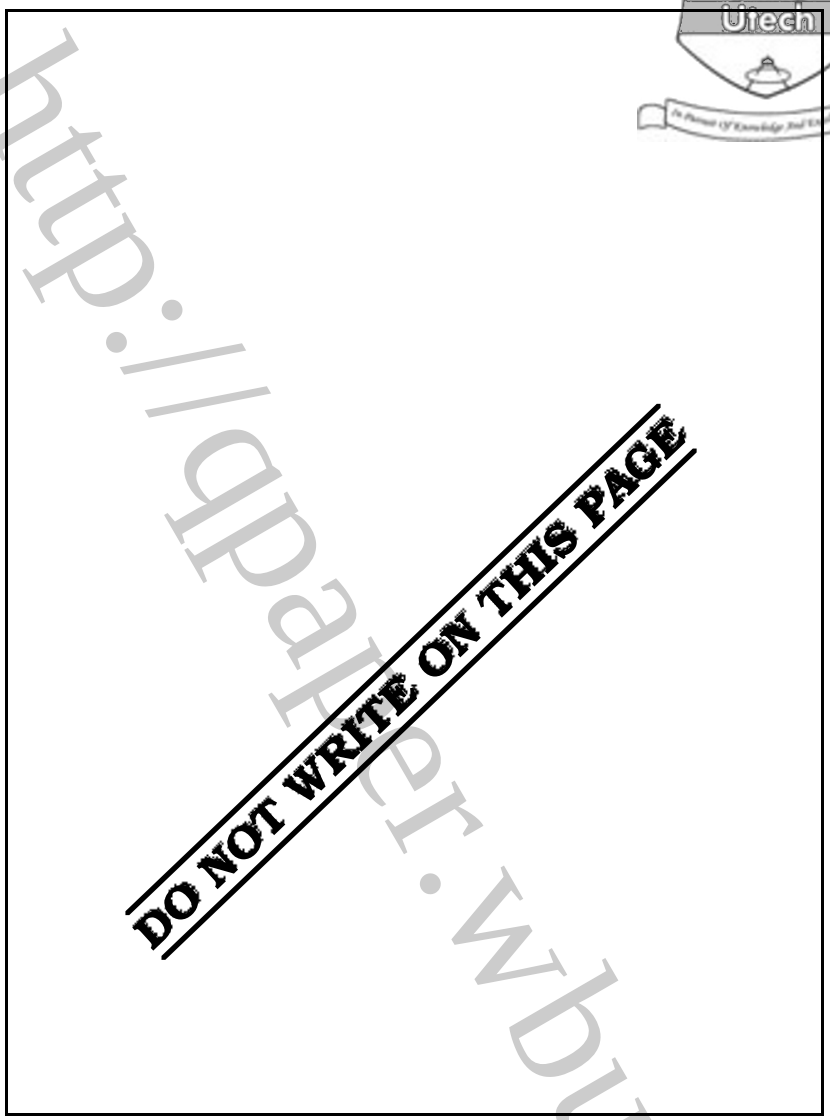

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Graph sheet is provided on Page No. 31.

GROUP – A

(Multiple Choice Type Questions)

1. Choose the correct alternatives for the following : 10 × 1 = 10

i) The face and back side of which base fabric is not alike

a) Single jersey b) Rib

c) Interlock d) None of these. ☐

ii) To produce a multi-track single jersey designed fabric on a circular weft knitting machine, you require

a) Needle set-out b) Cam set-out

c) Both of these d) None of these. ☐

iii) Lacoste is the derivative of

a) Single jersey structure b) Rib structure

c) Interlock structure d) None of these. ☐

iv) Rib is the derivative of

a) Plain weave b) Twill weave

c) Sateen weave d) Satin weave. ☐

v) Resultant linear desnity of 2-ply cotton yarn made of two 60^s (Ne) yarn is

a) 60^s b) 120^s

c) 30^s d) $1/30^s$ ☐

vi) Bursting strength tester measured strength in

a) all direction b) warp direction

c) weft direction d) none of these. ☐

vii) Single rip test is related to

a) Snag testing b) Tear testing

c) Abrasion resistance testing d) Bursting strength testing. ☐

viii) Design and lifting plan look alike for

a) Straight draft b) Skip draft

c) Pointed draft d) Satin draft. ☐

ix) Denier equivalence of 9 tex yarn is

a) 1 d b) 81 d

c) 18 d d) 9 d. ☐

x) Peg plan is also known as

a) Drafting plan b) Lifting plan

c) Design d) None of these. ☐

GROUP – B

(Short Answer Type Questions)

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

2. Explain the steps of producing a single jersey derivative structure from examining a small piece of sample of the same.

3. a) Give the specification and construction particulars of poplin and denim fabrics.

OR

b) Give the differences in specifications and construction of satin and sateen fabrics.

4. Give the graphical representation, drafting and lifting plan of the following designs : (any *one*) 5

a) 3/3, 2 ∞ 5 repeat of filling (weft) rib

OR

b) 2 ∞ 2-basket weave for 2 ∞ 2 repeats.

5. Two yarn feeders are required to produce one course of a basic interlock structure. Explain.

6. a) Define crimp in yarn of a textile fabric and derive the mathematical expression of such crimp. 3

b) Calculate the percentage crimp in the fabric, that is cut at points 160 mm apart and the yarn length that is subsequently removed from the fabric is 176 mm. 2

7. a) Calculate the total weight of the warp yarns per square metre of the fabric of 120 metres long, 1.3 metres of wide having 30 numbers of 12 tex warp yarns per cm. [Warp crimp = 5%]

OR

b) Discuss the method of determining bursting strength or tensile strength of any textile fabric.

GROUP – C

(Long Answer Type Questions)

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

8. a) Explain how the different stitches are produced on a weft knitting machine. 8

   b) Draw a 4-track single jersey design and prepare its cam set-out and needle set-out. 4

   c) 4-track circular weft knitting machines are more versatile than a 2-track ones in terms of producing designed fabrics. Justify. 3

9. a) Draw a 6-feeder design of interlock base and explain its needle fucntioning in different courses. 8

   b) How the weft knitting machines are classified in terms of capabilities of producing different designs on the fabrics ? 4

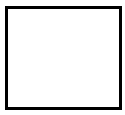
   c) How the guide bar of a warp knitting machine plays role in producing different designs on the fabrics ? 3

10. Show one full repeat of the following design with drafting and lifting plan : 3 × 5

    a) 4/4 warp rib for 4 ends then moves up 2 picks for each successive group.

    b) 3/3 broken twill (vertical break), 4 rights and 2 lefts.

    c) 5 harness checkboard satin of counter 2, Motif.



11. a) Derive the conversion factor between tex and Cotton count (English count Ne). 3

    b) Define the following mechanical properties of textiles : 6

       i) Tenacity ii) Toughness iii) Extension.

c) Derive the relationship between the linear density (in tex) and the dameter (in cm) and density (in g/cc) of a textile fibre. 4

d) What is irregularity index ? How is it measured ? 2

12. a) Explain the mechanism of pill formation on fabric surface. 3

b) Discuss the different factors affecting abrasion resistance of the fabric. 5

c) Explain the working principle of Elmendrof tear tester. 4

d) What is gauge length ? How does it affect the tensile strength of the textile materials ? 1 + 2

13. a) Discuss briefly the basic concept of FAST system for measuring some important low stress mechanical properties. 6

b) What are the differences between Kawabata and FAST System ? 4

c) Discuss the test method for determining abrasion resistance of a textile fabric. 5

END