CS/B.Tech(APM)/SEM-4/APM-402/2010

2010

FABRIC STRUCTURE & TEXTILE TESTING

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.*

GROUP – A

(Multiple Choice Type Questions)

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

    i)   The unit of thermal resistance is

          a)   centimetre   b)   clo

          c)   ohm   d)   tog.

    ii)   Weft on twist means

          a)   two single yarns with twist in same direction are
                doubled and twisted in opposite direction

          b)   two single yarns with twist in opposite direction are
                doubled and twisted in any of the directions

          c)   two single yarns with twist in same direction are
                doubled and twisted in same direction.

    iii) In metric count 1 hank is of

          a)   560 yards   b)   840 yards

          c)   1000 metres   d)   300 yards.

iv) Comfort of clothing is not related with

    a) tear resistance

    b) air permeability

    c) moisture vapour permeability

    d) insulation.

v) In CRL principles

    a) cause is extension, effect is load

    b) cause is load, effect is extension.

vi) Materials are tested in all directions at same time for

    a) tear resistance

    b) tensile strength

    c) bursting strength.

vii) The maximum design flexibility of single jersey fabric is obtained on

    a) full jacquard machine

    b) 4-track machine

    c) electronic jacquard machine

    d) mini jacquard machine.

viii) Which type of stitch requires new yarn feed but without old loop clearing ?

    a) Knit stitch   b) Tuck stitch

    c) Miss stitch   d) None of these.

ix) Ponte-de-Roma is the derivative of

    a) single jersey structure   b) rib structure

    c) interlock structure   d) none of these.

x) RKM is related to

    a) breaking load   b) breaking length

    c) stress   d) work factor.
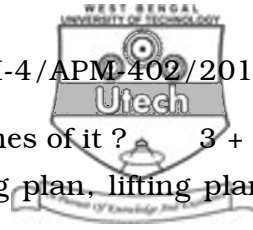
GROUP – B
(Short Answer Type Questions)
Answer any *three* of the following. $3 \times 5 = 15$

2. What are the factors that affect the tensile testing of textile materials ?

3. What is break factor ? What are other names of it ?   3 + 2

4. Give the graphical representation, drafting plan, lifting plan of 3/2, 2/1, 2*2 repeat of warp rib.

5. How are 4-track single jersey machines more flexible than 2-track machines in terms of design ?

6. Why a minimum of two tracks are required both in cylinder and dial of an interlock weft knitting machine ?

GROUP – C
(Long Answer Type Questions)
Answer any *three* of the following. $3 \times 15 = 45$

7. Show the repeat (as mentioned) of the following design with drafting and lifting plan :

   a) 3/2, 2/2 irregular basket.   3

   b) 4/2 pointed twill 3R-3L, vertical break for 2*2 repeat.   3

   c) 5 harness Satin warp face counter of 3   3

   d) Crepe weave of 8 harness Satin base and counter 5   3

   e) Diamond weave of 2/2, 8b ends and 8 picks.   3

8. a) How can the yarn be classified on the basis of twist ?   5

   b) Define twist multiplier.   2

   c) Calculate the TPI for 50^{s} cotton with TM of 4·3.   3

   d) Mention the effect of twist on fabric property.   5

9. a) Define the following mechanical properties :   8

      i)   Work of rapture

      ii) Specific stress

      iii) Yield point

      iv) Breaking length.

   b) Mention the different test methods of measuring tensile strength of textile fabric with the sample size and testing condition for each type.   4

   c) Define tear resistance and gauge length.   3

4064   3   [Turn over

10. a) Determine the conversion factor from English count to tex count. 4

b) Calculate the resultant count of ply yarn with 3 yarns each of count 30^s. 3

c) Convert the 40 metric count to English count. 4

d) Calculate the gsm of the fabric with following specification : 4

$30 \infty 24$; 12 tex ∞ 15 tex ; 5% ∞ 8%.

11. a) Define the following terms : 8

i) Air permeability

ii) Abrasion resistance

iii) Waterproof fabric

iv) Drape co-efficent.

b) What are the parameters related to the thermo-physiological comfort of the clothing ? 2

c) Discuss the factors affecting the abrasion resistance property of the fabric. 5

12. a) Show the cam profile of knit, tuck and miss cams and explain how these three stitches are produced on the machine. 8

b) What do you understand by needle set-out and cam set-out ? 3

c) What steps would you follow for changing the design from a plain single jersey to pique on a single jersey weft knitting machine ? 4

13. a) With the help of a suitable representation, explain the needle functioning of a 6-feeder interlock based design. 8

b) Draw a 4-feeder single jersey design and show its cam set-out and needle set-out. 7

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