THE TEXTILE ASSOCIATION (INDIA)
A.T.A. (REVISED) PART-II EXAMINATION – 2013
PAPER – A 2.1
PRINCIPLES OF YARN MANUFACTURE

Date: 23.12.2013

MARKS : 100

Time: 2 pm to 5 pm

Instructions:
1. Attempt six questions out of which Q.1 is compulsory
2. Answer each next main question on new page
3. Figure to the right indicate full marks
4. Illustrate your answer with sketches and flow chart wherever necessary
5. Use of non programmable electronic pocket calculator permissible.
6. Mobile and any other communication devices are not allowed in exam hall.
7. Assume suitable data wherever necessary.

Q.1. a. Fill in the Blanks :
   i. The ratio of the delivered length to the feed length is defined as ————.
   ii. The flats of a card rotate at a speed typically in the range of ————.
   iii. Unilap machine is a part of ———— process.
   iv. ———— spinning tension will help reduce fibre fly and lap formation.
   v. Higher the winding tension ———— the yarn tenacity and elongation.

b. State true or false and justify the statement :
   i. Staple fibres must be compresses into bales to assist in transportation and storage.
   ii. The licker in does not help in removing trashes held in cotton.
   iii. Carding is the least important process in spinning and does not contribute to yarn quality.
   iv. Changes in the yarn surface structure due to winding cannot be avoided.
   v. A high degree of yarn quality is not possible without splicing.

c. Underline the correct answer :
   In the blow room, cotton tuft size vary from
   ( 1mg to 5 mg, 5 mg to 150 mg, 50 mg to 500 mg).
   i. Bale layout can consists of upto (10, 30, 60) bales.
   ii. The fibres that are opened and cleaned by licker in system are transferred to
       the main cylinder by (Pushing action, Pulling action, Stripping action)
   iii. The conversion constant from English cotton system to denier is ( 590.5, 1535, 5315)
   iv. The most effective region in terms of carding intensity is between
       (Cylinder & licker in, Cylinder & flats, Cylinder & doffer).

d. Match the following
   i. Lap forming unit a. Direct yarn numbering system
   ii. Fancy yarn b. Indirect yarn numbering system
   iii. False twist c. Scutching
   iv. Tex system d. Chenille
   v. Metric system e. Reduces yarn breakage

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Q.2. a. What are the components of blowroom machines? Discuss each of them with examples supported by diagrams wherever appropriate.

b. Briefly describe the sequence of operations in the spinning process? Discuss the objectives and stages of blending?

Q.3. Write short notes on any 4 of the following:
   i. Waxing process
   ii. Piano feed (16) regulation motion
   iii. Fancy yarns
   iv. Degree of cleaning & opening
   v. Roving Tension.

Q.4. a. What are the functions of a carding machine? Discuss its operations with the help of a diagram.

b. What are the functions of auto leveller? Discuss the types of auto leveller and its operating principles.

Q.5. a. What are the functions of draw frame? Describe the importance of drafting arrangement in a draw frame.

b. Explain the cause and the impact of drafting waves. Discuss the modernisation that has taken place in draw frame machinery and process over the last two decades.

Q.6. a. Discuss the importance and functions of speed frame. What are the factors which affect the roving strength?

b. What are the functions of ring spinning? Discuss the mechanism of yarn balloon formation and its control in ring spinning.

Q.7. a. Discuss the importance of winding tension. What is the relevance of yarn faults and clearing during the winding operation.

b. What is the purpose of doubling and twisting of yarn? Discuss the methods of ply twisting?

Q.8. a. Calculate the English count of delivered sliver on drawing frame when doubling is 6, count of feeding sliver is 70 gr/yd, diameter of front roller is 30 mm and its rpm is 100, whereas the diameter of back roller is 15 mm and its rpm is 10.

b. Two yarns of 40s English count are doubled to form a twisted yarn. Express the resultant count in cotton English system as well as metric system.

c. Calculated the delivered sliver count of a draw frame sliver, if the feeding sliver is 64 grains/yd, the number doublings is 6 and the draft is 12.

d. Calculate the TPI (twists per inch) and TPM (twists per metre) produced on a simplex with diameter of front roller 28 mm and its rpm 30 and the rpm of flyer is 1000.