MAJOR TEST
TXL242: Technology of Textile Coloration

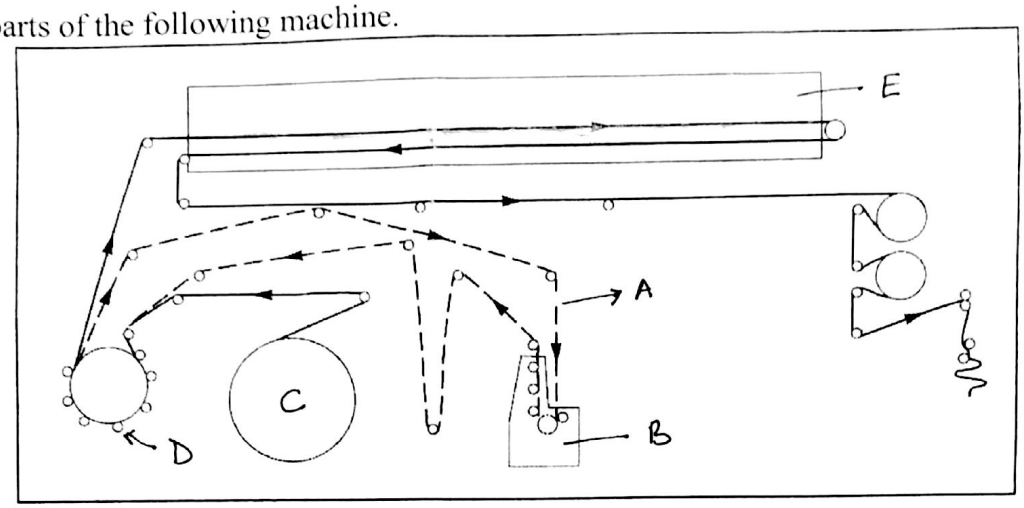
Date: 20th November 2015
Time: 1300-1500 hrs

Max. Marks: 45

Note: Attempt all questions. Answer Part A and Part B on separate answer sheets.

PART –A

1. Label the parts of the following machine. 2



2. Pigment printing requires a oil-in-water emulsion thickening and not the conventional thickening agent. Why? Do you envisage any limitations of the emulsion thickening? 3

3. Do as directed. Give brief answers (3-5 lines) 1.5x6

   a) How does the print paste move in the reverse direction after the completion of a stroke in case of rod squeegee in flab bed screen printing?
   b) The rod squeegees generally move along the width of the screen (along fabric movement) and not in the other direction. Explain.
   c) Sodium alginate is the better choice of thickener for reactive printing than starch. Justify.
   d) Festoon steamers are used for fixation of prints rather than cylinder driers. Why?
   e) Dichlorotriazinyl reactive dyes are not recommended for printing. Why?
   f) After fixation, the printed fabrics are given the first rinse with cold water and not with hot. Explain.

4. In the context of transfer printing, assuming ideal behaviour of dye vapours, $[C]_v = pM / RT$, where p is the saturation vapour pressure of the dye in atmosphere, R the gas constant in litre.atm /(deg.mole), M molecular weight in grams, and $[C]_v$ the equilibrium vapour concentration in g/l. [R – 0.082 L atm K^{-1} mol^{-1}]

   a) Calculate Vapour concentration, in g/ml at equilibrium, for following dyes 3

Dye	Molecular weight	Saturation Vapour Pressure (mm Hg), At 200 °C
C I Disperse Yellow 8	261	0.447
C I Disperse Violet 1	238	0.0206

   b) Which dye is likely to perform better with respect to transfer printing and why? 1

5. In oil in water emulsions, which are the continuous and dispersed phases? Under what conditions such emulsions become viscous and why? 2

6. How can the softening temperature of a binder film be regulated? Elaborate with suitable 2

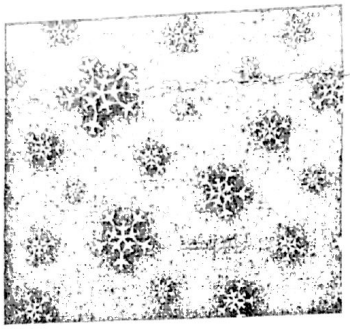
example.

7. In pigment printing, pastes based on emulsion thickeners need a potential acid but the ones based on synthetic thickeners do not. Why? 2

8. While application of color in case of discharge printing can be done by conventional immersion padding, nip padding is usually preferred for resist printing. 2

9. Fixation of pigment prints is preferably carried out in two stages – drying and curing rather than in a single stage combining the two. 2

10. Describe a process sequence for creating the design given on the right by printing. The dye to be used is a reactive dye with a dischargeability rating of 1. Also write the ingredients of the recipe with justification (not necessarily their concentrations). 2



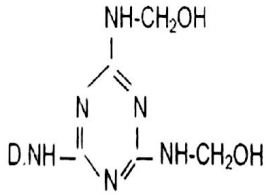
PART-B

11. In the context of dyeing, what is the objective of using basic co-monomers during polymerization of PAN? Explain – how does the Group-III (migrating type) basic dye helps in better-quality dyeing of the acrylic fibre? 1 +2

12. In dyeing of polyamide with 1:2 metal complex dye, where do you expect better leveling – when the dye used (a) contains $-NH_2$ as a solubilizing group, or (b) dye containing – SO_3Na as a solubilizing group and why? 0.5 +2

13. Do you think that all kinds of disperse dye can be dyed with carrier dyeing process? 'Originally developed disperse dye for acetate fibre was modified for its better suitability in polyester dyeing' – why this requirements thought off, explain? 0.5 +2

14. Look at the following dye structure and explain the advantages and disadvantages of using this reactive dye for cotton fibre? 2



15. **Fill-in the blanks** 1x2

I In reactive dyeing, covalent bonding occurs between .....atom of the dye and .....atom of cotton substrate.

II Along with electrostatic interaction of acid dye with nylon .....and ..... interactions are also possible.

16. **Comment with suitable justification** 1x3

I Kayacelon react dyes (nicotinic acid residue based reactive groups) can be used for single bath dyeing of PET/Cotton blend.

II In metachrome process, initial dye bath pH should be maintained at 6 – 6.5.

III Acidic pH is preferred in dyeing of PET with disperse dye but reduction clearing is done in presence of alkali.