



Daffodil International University

Department of Textile Engineering

Faculty of Engineering

Midterm Examination, Semester: Fall-2026

Course Code: 0723-313

Course Title: Textile Wet Processing II

Level & Term: L3T2

Section: F1, F2 & F3

Name & Designation of the Course Teacher: Dr. Md Morshedur Rahman, Assistant Professor
Shahariar Hossain Shuvo, Lecturer

Time: 1.5 Hours

Total Marks: 25

Answer all the questions. Marks are indicated against each question.

1. a) Explain why the rate of dyeing should be neither too slow nor too rapid during the exhaust dyeing process. Mention the major factors influencing the rate of dyeing. 3+2=5
[CO-1, PO-1, C/L-2]
b) Factory A and Factory B are assigned the same order to dye 100% cotton fabric using reactive dyes. Factory A uses a liquor ratio of 1:20, whereas Factory B uses a liquor ratio of 1:5. Mention the potential consequences for Factory A of using a higher liquor ratio than Factory B. [CO-1, PO-1, C/L-2]
2. Draw a neat, labeled diagram of a typical cone package dyeing machine. Briefly explain its working principle. [CO-1, PO-1, C/L-2] 4
3. a) A textile dyeing industry aims to minimize tension and creasing in knitted fabric during rope-form dyeing. Select the most suitable dyeing machine and justify your choice with two valid reasons. [CO-1, PO-1, C/L-2] 2+4=6
b) Calculate the fabric rope length and dyeing cycle time of a jet dyeing machine using the following data: [CO-1, PO-1, C/L-3]
 - Fabric GSM: 150 g/m²
 - Total fabric weight: 750 kg
 - Fabric rope diameter: 32 inches
 - Number of nozzles: 4
 - Winch speed: 240 m/min
4. A commercial reactive dye contains dichlorotriazine (DCT) as its reactive group. 2+3=5
a) Draw the chemical structure of the dye with features. [CO-1, PO-1, C/L-2]
b) Explain the mechanisms of chemical reaction in cotton dyeing. [CO-1, PO-1, C/L-2]
5. a) Classify the continuous dyeing methods used for cotton with reactive dyes. Briefly describe the steps involved in the pad-batch method with a suitable flow diagram. 3+2=5
[CO-1, PO-1, C/L-2]
b) In a continuous dyeing process, the wet pick-up during padding is 80%, and the dye concentration in the padding liquor is 1.5%. Calculate the amount of dye deposited on the fabric, expressed as a percentage of the fabric weight. [CO-1, PO-1, C/L-3]