



# Daffodil International University

Department of Textile Engineering

Faculty of Engineering

Midterm Examination; Spring-2026

Course Code: 0722-221

Course Title: Materials and Manufacturing Engineering

Level & Term: L3T1

Section: F1, F2, F3

Name & Designation of the Course Teacher: Dr. Md. Abdul Gafur (MAG) and Professor

Time: 1.5 hours.

Total Marks: 25

Answer all the questions:

|   |                                                                                                                                                                                                                                                      |   |       |
|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|-------|
| 1 | Analyze by finding i) ferrite and cementite, ii) ferrite and pearlite and iii) eutectoid ferrite, and also providing the microstructure for a 0.30%C steel temperature, just below eutectoid temperature. [CLO3, PO1, C4]                            | 8 | 8     |
| 2 | Examine the microstructure by estimating %C and tensile strength for steel (hypo-eutectoid steel) having 70% ferrite-pearlite microstructure in annealed condition at room temperature. The steel must be in annealed condition-why? [CLO3, PO1, C4] | 8 | 7     |
| 3 | Distinguish between Annealing and Normalizing. [CLO3, PO1, C4]                                                                                                                                                                                       | 4 | 4     |
| 4 | Analyze the microstructure that will be developed if cooling rate is slower than 140°C/S and faster than 35°C/S by defining critical cooling rate (CCR).[CLO3, PO1, C4]                                                                              | 5 | 1/0   |
|   |                                                                                                                                                                                                                                                      |   | 19/20 |