

Form Number: OBE/TE/Spring-2026



Daffodil International University

Department of Textile Engineering

Faculty of Engineering

Final Examination; Spring-2026

Course Code: 722-721

Course Title: Materials and Manufacturing

Engineering Level & Term: L2T3

Section: F1, F2, F3

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

Time: 02 hours.

Total Marks: 40

Answer all the questions:

Marks

4+3+3

Q1. How can you prove $a_0 = \frac{4r}{\sqrt{3}}$ and APP = 0.68 for BCC crystal.

List in a table i) no of atoms per unit cell, ii) coordination number and iii) atomic packing factor for SC, BCC and FCC crystals.

Define Rock salt structure.

[CLO1, PO1, C1]

Q2. Distinguish between brittle and ductile fracture?

3+4+3

Examine stress-strain curve for brittle and ductile materials.

Analyze the steps of ductile fracture

[CLO2, PO1, C4]

Q3. Compare between electronic and ionic conduction.

3+2+5

Metals are strong electrical conductors-Explain?

An Al-8%Si alloy rod is heated from 20 to 220°C. The linear thermal expansion co. is 20.5/°C. Show the compressive stress developed if the rod is not allowed to free move. Given elastic modulus of Al-8% Si alloy is 80 GPa.

[CLO4, PO1, C2]

Q4. a) Illustrate B-H loop. Interpret Coercivity (Hc) and Remanence (Br).

3+2+5

Relate magnetic field, H and Magnetic flux density, B.

A magnetic material is placed inside a solenoid. The magnetic field intensity is H = 2000 A/m, and the magnetization of the material is M = 500 A/m. Show the value of B.

[CLO4, PO1, C2]

 3.14×10^{-3}
 $3.28 \times 10^{14} \text{ Pa}$