Form Number: OBE/TE/Spring-2026

$4\pi \times 10^{-7}$

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
Q1.	a) How can you prove $a_0 = \frac{4r}{\sqrt{3}}$ and APP = 0.68 for BCC crystal.	4+3+3
	b) 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.	
	c) Define Rock salt structure.	
	[CLO1, PO1, C1]	
Q2.	a) Distinguish between brittle and ductile fracture?	3+4+3
	b) Examine stress-strain curve for brittle and ductile materials.	
	c) Analyze the steps of ductile fracture	
	[CLO2, PO1, C4]	
Q3.	a) Compare between electronic and ionic conduction.	3+2+5
	b) Metals are strong electrical conductors-Explain?	
	c) An Al-8%Si alloy rod is heated from 20 to 220°C. The liner 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
	b) Relate magnetic field, H and Magnetic flux density, B.	
	c) 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}

3.28×10^{14} Pa