JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT
TEST -1 EXAMINATION- 2026
B.Tech-V Semester

COURSE CODE (CREDITS): 25B1WPH535 (03) MAX. MARKS: 15
COURSE NAME: Science and Technology of Materials
COURSE INSTRUCTOR: PBB MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory. (b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems (c) Use of calculator is allowed*

Q.No	Question	CO	Marks
Q1	At 27°C, the dielectric constant of sulphur is 3.75. Internal field coefficient of sulphur is $\gamma=1/3$. If the density of sulphur at 27°C is 2050 kg/m^3, then calculate the electronic polarizability of sulphur. Given that the atomic weight of sulphur is 32.	3	3
Q2	If a dielectric sample has its dielectric constant 4 and refractive index 1.5, then calculate the ratio of the electronic and ionic polarizabilities.	3	3
Q3	Derive Clausius-Mossotti equation.	1	3
Q4	Find the relative displacement of nucleus and electron cloud under the influence of an externally applied electric field.	2	3
Q5	Explain stress-strain diagram for ceramic material.	5	3

SAMPLE

$m_e=9.11x10^{-31}$ kg; $e = 1.6x10^{-19}$ C; $N_A = 6.023x10^{23}$; $k_B=1.38x10^{-23}$ J/K; $\varepsilon_o=8.85x10^{-12}$ F/m; $\mu_B=9.27x10^{-24}$ Am^2;