National Institute of Technology Kurukshetra
B. Tech. PHIC-101, Sessional – II (CE, PI, ME, EC, EE only)
All questions are compulsory (16/11/2023)

Time allotted: 50 min.   Max. Marks: 20

1	Determine the average energy and speed of electron at its mean energy at 0K, if the Fermi energy is 10eV.	3
2	Discuss the terms Acceptance angle and Numerical Aperture. Estimate the values of critical angle, acceptance angle and numerical aperture if a ray of light enters from air to fiber having parameters μ_{air}=1, μ_{clad}=1.46, and μ_{core}=1.49.	5
3	Calculate the energy of laser pulse in a ruby laser for concentration 2.8×10^{19} Cr^{3+} ions. If the laser emits radiation of wavelength 6943 Å.	4
4	What is Temporal Coherence? Explain why two level laser is not possible, in detail.	5
5	Determine the Miller indices of plane parallel to the z axis and cut intercepts of 2 and 2/3 along x and y axes, respectively.	3