KERALA AGRICULTURAL UNIVERSITY
B. Tech. (Agrl. Engg.)
I Semester Final Re - Examination – February 2026
2023 & Previous Admissions

Sacs.1102 | **Engineering Physics (2+1)** | **Marks: 50**
Time: 2 hours

I Fill in the blanks **(10x1=10)**

1. Fringe width is .... proportional to slit width.
2. In Helium-Neon laser, the population inversion takes place .... Atom.
3. For paramagnetic substances, the susceptibility is .... and ....
4. Numerical aperture in fiber optics is .... of the acceptance angle.
5. The critical magnetic field in superconductivity...........with decrease in temperature.
6. To explain the band theory of solids, the nature of potential is ....

State True or False

7. The conductivity of semiconductors decreases with increase in temperature .
8. Normal Zeeman effect take place for atoms with $L \neq 0$ and $S \neq 0$.
9. In Langevin's theory of paramagnetism, the plot between susceptibility and (1/T) is a straight .
10. Diameter of n^{th} Newton's ring is proportional to cube root of order (n) .

II Write short notes on ANY FIVE of the following **(5x2=10)**

1. What are coherent sources of light?
2. Why it is difficult to build high frequency lasers?
3. Explain type 1 and type II superconductors.
4. Discuss domain theory of ferromagnetism.
5. Discuss intermodal dispersion.
6. Explain population inversion.
7. Explain the formation of colors in thin films.

III Answer ANY FIVE of the following **(5x4=20)**

1. A superconductor has critical temperature of 4.1K in zero magnetic field. The critical magnetic field is 0.0505 T at 0 K. Find critical field at 2K.
2. Write four applications of nano devices in agriculture.
3. Discuss and explain the splitting of spectral lines in the presence of low magnetic field.
4. Prove that fermi level is at center of forbidden gap for intrinsic semiconductors.
5. Discuss construction, principle and energy diagram of Ruby laser.
6. Derive the expression for energy splitting in Paschan-back effect.
7. What is zero resistance and discuss Mesissner effect.

IV Write an essay on ANY ONE of the following **(1x10=10)**

1. What are intrinsic and extrinsic semiconductors. Derive the electron and hole density for an intrinsic semiconductor. Also, derive the law of mass action.
2. Write five differences between diamagnetic and paramagnetic. Derive the Langevin's theory of paramagnetism. Discuss it for different temperature conditions.

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