KERALA AGRICULTURAL UNEVERSITY
B. Tech. (Agrl. Engg.) 2024 Admission
III Semester Final Examination – January 2026

BES 2107   Engineering Physics (2+1)   Marks: 50
Time: 2 hours

I   Answer the following   (10x1=10)
1.   What is molecular field?
2.   Low-temperature cooling with the aid of a magnetic field is known as?
3.   Name the equation governing quantum mechanical systems.
4.   What causes the Zeeman effect?
5.   Name the band responsible for electrical conduction.
6.   Which parameter defines the response of an electron in a crystal lattice?
7.   Name the quantity equal to the product of electron and hole concentrations.
8.   Give the SI unit of luminous intensity.
9.   How many Josephson junctions are used in a DC SQUID?
10.   Name a material used in an Ammonia maser.

II   Write short notes on ANY FIVE of the following   (5x2=10)
1.   What is a wave function?
2.   Why is Raman spectroscopy considered a powerful analytical tool?
3.   How does temperature affect carrier concentration in semiconductors?
4.   What is isotope effect?
5.   State the inverse square law of illumination.
6.   Distinguish spatial and temporal coherence
7.   Lambert's Cosine Law

III   Answer ANY FIVE of the following   (5x4=20)
1.   Explain Weiss molecular field theory of ferromagnetism.
2.   State and explain Heisenberg's uncertainty principle
3.   Explain intrinsic and extrinsic semiconductors. Discuss the role of donors and acceptors with suitable energy band diagrams.
4.   Explain the Zeeman effect. Give a qualitative account of normal and anomalous Zeeman effects.
5.   Explain the working principle of Ammonia maser and discuss their applications.
6.   Explain the working principle of Ruby maser and discuss their applications
7.   Explain the principle of holography.

IV   Write an essay on ANY ONE of the following   (1x10=10)
1.   Derive the expression for steady state (Time-independent) Schrodinger's equation.
2.   Explain the Meissner effect. Distinguish between Type I and Type II superconductors with suitable diagrams.

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