Question Paper Code: R15A12HS03/R14A12HS03

R15/R14

ANURAG Engineering College

(An Autonomous Institution)

I B.Tech II Semester Supplementary Examinations, Jan/Feb-2024

Engineering Physics – II

(COMMON TO ALL BRANCHES)

Time: 3 Hours **Max. Marks: 75**

Section – A (Short Answer type questions) (25 Marks)

Answer All Questions		Course Outcome	B.T Level	Marks
1.	Write the physical significance and Born interpretation of wave function.	CO1	L2	2M
2.	Calculate de-Broglie wavelength for electron accelerated under 54 V potential.	CO1	L1	3M
3.	Write a note on the drawbacks of the classical theory.	CO2	L2	2M
4.	Define Bloch Theorem.	CO2	L1	3M
5.	Define Hall effect.	CO3	L1	2M
6.	Define snell's law.	CO3	L2	3M
7.	Define metastable state.	CO4	L1	2M
8.	What are the essential components in LASER construction.	CO4	L2	3M
9.	Define surface to volume ratio.	CO5	L1	2M
10.	Explain applications of Nano materials.	CO5	L2	3M

Section B (Essay Questions)

Answer all questions, each question carries equal marks. **(5 X 10M = 50M)**

11. A)	Explain de-Broglie hypothesis, Uncertainty principle. Mention the properties of Matter Waves. estimate energy level of electron in the infinite potential well length of 2A°.	CO1	L3	10M
	OR			
B)	Describe and explain Davisson- Germer experiment to prove Wave Nature of particles.	CO1	L2	10M
12. A)	Define and Derive expression for the density of energy states. For a given material, the density of states (DOS) in the conduction band is 4×10^{20} states/eV. Calculate the total number of states in the conduction band for an energy range of 2 eV to 4 eV.	CO2	L3	10M
	OR			
B)	Explain the Classification of materials into conductors, semiconductors & Insulators. Derive effective mass of electron.	CO2	L2	10M
13. A)	Define and Explain fermi level variation in extrinsic semiconductors. Explain construction and working of LED.	CO3	L2	10M
	OR			
B)	Define total internal reflection, Acceptance angle, Numerical Aperture and Acceptance cone. An optical fiber with a numerical aperture (NA) of 0.45, calculate the acceptance angle.	CO3	L3	10M
14. A)	Derive relation between Einstein coefficients. Write a note on applications of LASER.	CO4	L2	10M
	OR			
B)	Explain construction and working of He-Ne LASER.	CO4	L3	10M

15. A)	Explain the sol-gel preparation and ball milling.	CO5	L2	10M
	OR			
B)	Explain the construction of SEM and TEM.	CO5	L3	10M