

ANURAG Engineering College

(An Autonomous Institution)

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

APPLIED PHYSICS

(COMMON TO CE, EEE ECE & IT)

Time: 3 Hours**Max. Marks: 60****Section – A (Short Answer type questions)****(10 X 1M = 10M)****Answer All Questions**

	Course Outcome	B.T Level	Marks
1. What is the use of Nicol prism?	CO1	L1	1M
2. What do you mean by thin film?	CO1	L1	1M
3. What is the importance of division and Germer experiment?	CO2	L1	1M
4. What are the three failures of classical free electron theory?	CO2	L1	1M
5. List a few LED applications in everyday life.	CO3	L1	1M
6. How is a photodiode different from a solar cell?	CO3	L1	1M
7. What is the effect of increasing surface area of nanoparticles?	CO4	L1	1M
8. What are top down and bottom-up approach in nanotechnology?	CO4	L1	1M
9. Explain the difference between spontaneous and stimulated emission in lasers.	CO5	L2	1M
10. What is optical fiber? On what principle does it work?	CO5	L1	1M

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

11. A) i) What are Newton's Rings and how are they formed?	CO1	L3	6M
ii) Apply the Newton's Rings concept; Calculate the refractive index of the liquid when the diameter of the 10 th ring changes from 1.40 to 1.27 cm when a drop of liquid is placed between the lens and the glass plate.		L3	4M
OR			
B) Analyze and describe the intensity distribution of a Fraunhofer diffraction of a single slit.	CO1	L3	10M
12. A) Examine that the energies of a particle in a potential box are quantized.	CO2	L3	10M
OR			
B) Examine how the Kronig-Penney model produces energy band structure in materials.	CO2	L3	10M
13. A) What is Hall effect and develop an expression for Hall coefficient. (Note: Illustrate with neat diagram)	CO3	L3	10M
OR			
B) Identify the construction and operation of a solar cell with neat diagram	CO3	L3	10M
14. A) What is the principle behind the Transmission Electron Microscope? Explain construction and working of TEM with neat sketch.	CO4	L3	10M
OR			
B) Distinguish between Top-Down and Bottom-Up approaches with examples	CO4	L3	10M
15. A) Analyze the operation of a He-Ne laser system using a neat energy level diagram.	CO5	L3	10M
OR			
B) Develop an expression for the numerical aperture of an optical fiber with core and cladding refractive indices being n_1 and n_2 . Assume that it has been placed in a medium with refractive index n_0 .	CO5	L3	10M