An AUTONOMOUS Institution

ACE- R20

Question Paper Code: PH202BS

Semester End Examination
I B. Tech- II Semester- September 2021
APPLIED PHYSICS
(Common to EEE,CSE,IT,CSD)

Time: 3 Hours   **Max. Marks: 70**

H. T. No

Answer any five full questions from the following. All Questions carry equal marks.
M=Marks; CO=Course Outcomes; PO= Program Outcomes

Q.No	Question	M	CO	PO
1. a)	Define wave-particle dual nature and explain de-Broglie hypothesis.	6	1	1
b)	Explain how time-independent Schrodinger equation is deduced ?	6	1	1,2
c)	How Born interpreted wave equation?	2	1	1
2. a)	Write down Schrodinger wave equation for a particle moving in 1D-potential box	7	1	1,2
b)	How Kronig-Penney model explains energy band structure in solids?	7	1	1,2
3. a)	Distinguish between extrinsic and intrinsic semiconductors.	7	2	1
b)	Obtain an expression for carrier concentration of n-type semiconductor.	7	2	1,2
4. a)	Explain diode and Zener diode. Describe its volt-ampere characteristics.	7	2	1
b)	Describe construction and principle of operation of BJT.	7	2	1
5. a)	Write the characteristics and figure of merit of semiconductor photo detector.	7	4	1
b)	Explain working principle of PIN photo diode and its characteristics.	7	4	1
6. a)	Why population inversion should be established for laser action?	7	5	1
b)	List different types of Lasers and write their applications.	5	5	1,12
c)	The output power and wavelength of emitted light of He-Ne laser is 2.3 mW and 672.8 nm respectively. Calculate approximately how many photons are emitted per second during its operation.	2	5	1,2
7. a)	Explain the terms: (i) Numerical aperture (ii) phenomenon of total internal reflection (iii) acceptance angle.	6	5	1
b)	Distinguish between step and graded index fibers. Write the applications of optical fiber.	8	5	1
8. a)	Draw the ferromagnetic hysteresis curve and explain it. Write the applications of magnetic materials.	6	6	1
b)	State and explain Ampere and Faradays laws.	8	6	1