Q.P. Code: 16HS603 **R16**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)
B.Tech I Year I Semester (R16) Regular & Supplementary Examinations Dec 2017
ENGINEERING PHYSICS
(Common to CE, EEE, Agri.E & ME)

Time: **3 hours** Max. Marks: **60**

(Answer all Five Units **5 X 12 = 60** Marks)

UNIT-I

1	a.	Explain the formation of Newton's rings with suitable theory.	9M
	b	In a Newton's ring experiment, the diameter of the 5^{th} dark ring is a 0.3 cm and the 25^{th} ring is 0.8 cm. If the radius of curvature of the plano convex lens is 100 cm. Find the wavelengths of the light used.	3M
		OR	
2	a.	Describe the construction and working of Nd: YAG laser with neat diagram	8M
	b.	Explain the terms stimulation emission and population inversion	4M

UNIT-II

3	a.	Define packing fraction? Show that FCC is the most closely packed of the three cubic structures by working out the packing factors.	8M
	b.	Sketch the planes in a simple cubic structure (110) and (001)	4M
		OR	
4	a.	With necessary circuit diagram explain the production of ultrasonic using piezoelectric crystal.	7M
	b.	Deduce the Sabine's formula for the reverberation time. A hall has a volume of $5000m^3$. It is required to have reverberation time of 1.5 second. What should be the total absorption in the hall?	5M

UNIT-III

5	a.	Apply the Schrödinger's wave equation for a particle confined to a rigid box and discuss its wave functions and energy levels.	9M
	b.	An electron is bound in a one-dimensional box having size of 4×10^{-10} m. What will be its minimum energy?	3M
		OR	
6	a.	Distinguish between Drude-Lorentz theory and Somerfield's theory of metals	6M
	b.	Derive an expression for the electrical conductivity of metal using classical free electron theory?	4M

UNIT-IV

7	a.	Describe the drift and diffusion currents in a semiconductor and derive their expressions?	8M
	b.	State Hall Effect and its applications	4M
		OR	
8	a.	Distinguish between soft and hard magnetic materials and their applications?	6M
	b.	Write a short note on Bohr magnetron? How it is related to magnetic moment of electron?	6M

UNIT-V

9	a.	Explain the following terms: (i) Critical temperature (ii) Isotope effect (iii). Magnetic effect	6M
	b.	Describe the BCS theory of superconductivity	6M
		OR	
10	a.	What are nanomaterials? Explain the basic principle of nano materilas	8M
	b.	Write any four application of nano materials?	4M

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