Q.P. Code: 19HS0850 **R19**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations July-2022

ADVANCED PHYSICS

(Mechanical Engineering)

Time: 3 hours Max. Marks: 60

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

UNIT-I

1	**a**	Write brief note on experimental arrangement of Newton's rings.	**L1**	**7M**
	b	Explain how the wavelength of light sources is determined by forming Newton's ring.	**L2**	**5M**
		OR		
2	**a**	Derive the conditions to get principal maximum and minimum intensity positions due to single slit due to Fraunhofer single slit diffraction.	**L4**	**7M**
	b	Draw intensity distribution curves and give condition for bright and dark fringes in single slit diffraction pattern.	**L1**	**5M**

UNIT-II

3	**a**	Write Sabine's formula for reverberation time? Mention factors controlling the reverberation time?	**L1**	**7M**
	b	A hall of volume 1000 m^3 is found to have a reverberation time of 2 seconds. If the area of the sound absorbing surface is 350 m^2, calculate average absorption coefficient?	**L3**	**5M**
		OR		
4	**a**	How ultrasonics are produced by using piezoelectric generator?	**L2**	**8M**
	b	A quartz crystal has a thickness of 4×10^{-3} and density 3×10^3 kg/m^3. Calculate its fundamental frequency. Give the Youngs modulus of crystal is 8.2×10^{10} N/m^2.	**L3**	**4M**

UNIT-III

5	**a**	Describe the classification of magnetic materials based on spin magnetic moments	**L1**	**8M**
	b	Discuss the applications of soft magnetic materials.	**L2**	**4M**
		OR		
6	**a**	Explain phenomenon of electric polarization in dielectrics. Derive an expression for that.	**L2**	**8M**
	b	The dielectric constant of He gas at NTP is 1.0000684. calculate the electronic polarizability of He atoms if the gas contains 2.7×10^{25} atoms per m^3.	**L3**	**4M**

UNIT-IV

7	**a**	Explain the construction and working principle of He-Ne laser with suitable energy level diagram.	**L2**	**8M**
	b	Write few advantages of He-Ne laser.	**L1**	**4M**
		OR		
8	**a**	What is the acceptance angle of an optical fibre ? and derive an expression for it.	**L1**	**8M**
	b	An optical fibre has a core refractive index of 1.44 and cladding refractive index of 1.40. Find its θ_a.	**L3**	**4M**

UNIT-V

9	**a**	Explain why surface to volume ratio very large for nano materials.	**L2**	**7M**
	b	Write the applications of Nano materials.	**L1**	**5M**
		OR		
10	**a**	How we synthesis nanomaterial by Sol-Gel technique.	**L2**	**8M**
	b	Write advantages of sol-gel process.	**L1**	**4M**

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