O.P.Code: 20HS0848	R20	H.T.No.									

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR
(AUTONOMOUS)

B.Tech I Year II Semester Regular & Supplementary Examinations August-2023

ENGINEERING PHYSICS
(Mechanical Engineering)

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

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

		UNIT-I			
1	**a**	Describe the formation of Newton's rings with necessary theory with relevant diagram and derive the expressions for dark and bright fringes.	**CO1**	**L3**	**9M**
	b	In a Newton's rings experiment, the diameter of the 5th ring is 0.30 cm and the diameter of the 15th ring is 0.62 cm. Calculate the diameter of the 25th ring.	**CO1**	**L4**	**3M**
		OR			
2	**a**	Describe Fraunhoffer diffraction due to double slit and derive the conditions for principal maxima, secondary maxima and minima.	**CO1**	**L3**	**9M**
	b	A plane transmission grating having 4250 lines per cm is illuminated with sodium light normally. In the second order spectrum, the spectral lines are deviated by 300. What is the wavelength of the spectral line?	**CO1**	**L4**	**3M**
		UNIT-II			
3	**a**	Derive the packing factor of SC.	**CO2**	**L4**	**6M**
	b	Derive the packing factor of BCC.	**CO2**	**L4**	**6M**
		OR			
4	**a**	Explain the principle, procedure and advantage of Debye-Scherrer (Powder method) of X-ray diffraction.	**CO2**	**L4**	**6M**
	b	Find the angle at which the third order reflection of X-ray of 0.79Ao wavelength can occur in a calcite crystal of 3.04x10-10 spacing?	**CO2**	**L1**	**6M**
		UNIT-III			
5	**a**	Derive Sabine's formula for reverberation time. Mention factors controlling the reverberation time.	**CO3**	**L1**	**7M**
	b	A hall of volume 1000 m3 is found to have a reverberation time of 2seconds. If the area of the sound absorbing surface is 350 m2, calculate average absorption coefficient?	**CO3**	**L4**	**5M**
		OR			
6	**a**	Describe the application of Ultrasonics in non-destructive testing (NDT) of material.	**CO3**	**L2**	**8M**
	b	Explain Piezoelectric effect.	**CO3**	**L4**	**4M**
		UNIT-IV			
7	**a**	Define the following i) Elasticity ii) isotropic materials iii) rigid body iv) Plasticity v)Hooke'slaw	**CO4**	**L1**	**5M**
	b	What is stress? Explain different types of stresses.	**CO4**	**L4**	**7M**
		OR			
8	**a**	Define Young's modulus and rigidity modulus.	**CO4**	**L1**	**4M**
	b	Obtain the relation between rigidity modulus and Young's modulus.	**CO4**	**L4**	**8M**
		UNIT-V			
9	**a**	Explain the Type-I and Type-II superconductors.	**CO5**	**L4**	**7M**
	b	What is Meissner effect?	**CO5**	**L1**	**5M**
		OR			
10	**a**	Explain Sol-Gel technique for synthesis of nanomaterial.	**CO5**	**L4**	**8M**
	b	Write advantages of sol-gel process.	**CO5**	**L1**	**4M**

***** END *****