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

B.Tech I Year I Semester Regular Examinations January 2020

ADVANCED 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 ring with necessary theory. **7M**
b Explain how the wavelength of light sources is determined by forming Newton's rings. **5M**

OR

- 2 a What is diffraction grating how it is constructed? **8M**
b A plane grating having 10520 lines per cm is illuminated with light having a wave length of 5×10^{-5} cm at normal incidence, then how many orders are visible in the grating spectra? **4M**

UNIT-II

- 3 a What is the importance of acoustics in engineering? **6M**
b How we optimize the reverberation time in the music halls? **6M**

OR

- 4 a Write the properties of Ultrasonic waves. **6M**
b Explain the detection methods of Ultrasonic waves. **6M**

UNIT-III

- 5 a Define i) magnetic moment and ii) magnetic susceptibility. **4M**
b Explain the origin of magnetic moments. **8M**

OR

- 6 a Derive the expression for electronic polarizability in dielectrics. **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 . **4M**

UNIT-IV

- 7 a Explain the construction and working of Nd:YAG laser with suitable energy level diagram. **8M**
b What are the advantages of Nd:YAG laser? **4M**

OR

- 8 a What is the acceptance angle of an optical fibre and derive an expression for it. **8M**
b An optical fibre has a core refractive index of 1.44 and cladding refractive of 1.40. Find its acceptance angle and numerical aperture. **4M**

UNIT-V

- 9 a Explain why surface to volume ratio very large for nano materials? **8M**
b What is Quantum Confinement? **4M**

OR

- 10 a How we synthesis nanomaterial by Sol-Gel technique? **8M**
b Write advantages of sol-gel process. **4M**

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