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

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

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**

(AUTONOMOUS)

**B.Tech I Year I Semester Supplementary Examinations November-2020**

**ADVANCED PHYSICS**

**(**Mechanical Engineering**)**

Time: 3 hours Max. Marks: 60

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

**UNIT-I**

| | | | |
|---|---|---|---|
| **1** | **a** | Distinguish between interference and diffraction. | **6M** |
| | **b** | Distinguish between Fresnel's and Fraunhofer diffraction. | **6M** |
| | | **OR** | |
| **2** | **a** | Write brief note on grating spectrum. | **6M** |
| | **b** | How you determine the wavelength of light using grating spectrum? | **6M** |

**UNIT-II**

| | | | |
|---|---|---|---|
| **3** | **a** | Define absorption coefficient of sound and derive expression for it. | **8M** |
| | **b** | A class room of volume 360 $m^3$ has a reverberation time 1.6 seconds. Calculate the total sound absorption coefficient of the class room? | **4M** |
| | | **OR** | |
| **4** | **a** | Explain Piezoelectric effect. | **4M** |
| | **b** | Describe the application of Ultrasonics in non-destructive testing (NDT) of a material. | **8M** |

**UNIT-III**

| | | | |
|---|---|---|---|
| **5** | **a** | Define magnetic susceptibility and permeability. Obtain the relation between them. | **8M** |
| | **b** | Find the relative permeability of ferro magnetic material if a magnetic field of strength 220 A/m produces magnetization 3300 A/m in it. | **4M** |
| | | **OR** | |
| **6** | **a** | Discuss the frequency dependence of various polarization processes in dielectric materials. | **8M** |
| | **b** | Explain the important requirements of insulators. | **4M** |

**UNIT-IV**

| | | | |
|---|---|---|---|
| **7** | **a** | Derive the relation between the various Einstein's coefficients of absorption and emission of radiation. | **8M** |
| | **b** | Explain population inversion. | **4M** |
| | | **OR** | |
| **8** | **a** | Explain the block diagram of fiber optic communication system. | **8M** |
| | **b** | What are the applications of fiber optics? | **4M** |

**UNIT-V**

| | | | |
|---|---|---|---|
| **9** | **a** | What is nanotechnology? How it is useful to the society? | **8M** |
| | **b** | Discuss properties of nanomaterials. | **4M** |
| | | **OR** | |
| **10** | **a** | What is top down approach and explain ball milling technique for synthesis of nano material. | **8M** |
| | **b** | Write the disadvantages of ball milling technique. | **4M** |

*** END ***