Reg.No. \_\_\_\_\_\_\_\_\_\_\_\_



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

**End Semester Examination – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **13PH201** | **Duration :** | **3hrs** |
| **Sub. Name :** | **APPLIED PHYSICS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

|  |  |  |  |  |
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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Describe with the necessary theory the Davisson and Germer experiment for establishing the wave nature of the electrons. | CO 1 | **15** |
| b. | Give some properties of matter waves | CO 1 | **5** |
| **(OR)** | | | | |
| 2. | a. | Derive the Schrodinger time dependent and time independent wave equation. | CO 1 | **20** |
|  |  |  |  |
| 3. | a. | Explain with neat sketch the construction, principle and working of He-Ne laser along with energy level diagram | CO 1 | **15** |
|  | b. | For semiconductor laser, the band gap is 0.80 eV. What is the wavelength of light emitted from it? | CO2 | **5** |
| **(OR)** | | | | |
| 4. | a. | What are the vibrational modes of CO2 molecule? | CO 1 | **5** |
|  | b. | With a neat sketch and energy level diagram, explain the construction, principle and working of CO2 laser. | CO 1 | **15** |
|  |  |  |  |  |
| 5. | a. | Explain the classification of optical fibre based on material, mode and refractive index profile in detail | CO 1 | **15** |
|  | b. | The refractive index of core and cladding materials of an optical fiber are 1.55 and 1.49 respectively. Calculate the numerical aperture, acceptance angle and critical angle. | CO 2 | **5** |
| **(OR)** | | | | |
| 6. | a. | What is Numerical aperture? Derive an expression for numerical aperture and angle of acceptance of fiber in terms of refractive index of core and cladding. | CO 1 | **15** |
|  | b. | Find the numerical aperture, acceptance angle and critical angle for a step index fibre for which the core and cladding refractive index values are 1.5 and 1.45 respectively. | CO 2 | **5** |
|  |  |  |  |  |
| 7. | a. | Explain the factors affecting the architectural acoustics of a building and their remedy. | CO 1 | **12** |
|  | b. | Calculate the fundamental frequency of vibration when a quartz crystal of 0.28cm thickness is vibrating at resonance. Given, Young’s modulus = 7.9 x 1010 Nm-2 and density of crystal = 2650 kgm-3. | CO 2 | **5** |
|  | c. | What is an acoustical diffraction? | CO 1 | **3** |
| **(OR)** | | | | |
| 8. | a. | What is meant by magnetostriction effect? | CO 1 | **3** |
|  | b. | Explain with a neat sketch, how ultrasonic waves are produced using a magnetostriction oscillator. | CO 1 | **12** |
|  | c. | The volume of a room is 1500 m3. The wall area of the room is 260 m2, the floor area is 140 m2 and the ceiling area is 140 m2. The sound–absorption coefficient for the wall is 0.03, for the ceiling is 0.8 and for the floor is 0.06. Calculate the average absorption coefficient and the reverberation time. | CO 2 | **5** |
|  | | **Compulsory:** |  |  |
| 9. | a. | Based on the properties of magnetism compare and tabulate dia, para and ferromagnetic materials. | CO 1 | **18** |
|  | b. | Write a short note on Maglev. | CO 1 | **2** |

ALL THE BEST