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 – April/May – 2017**

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| **Code :** | **14PH1001** | **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. | State and explain Heisenberg Uncertainty Principle with an example. | CO1 | 4 |
| b. | Define matter wave. Mention few properties of matter waves. | CO1 | 4 |
| c. | Derive Schrodinger time independent wave equation. | CO1 | 12 |
| (OR) | | | | |
| 2. | a. | Calculate the deBroglie wavelength in eV if the applied potential is 240 Volts. | CO1 | 4 |
| b. | Explain the application of Schrödinger wave equation to a particle in an infinite one dimensional potential well and find the eigen function and eigen values. | CO1 | 16 |
| 3. | a. | Explain the principle of laser with adequate diagram. Also briefly describe the properties of laser. | CO1 | 8 |
|  | b. | How will you achieve population inversion in He-Ne laser? Explain the construction and working in detail with necessary energy level diagram. | CO1 | 12 |
| (OR) | | | | |
| 4. | a. | What is optical resonator? Explain in detail. | CO1 | 6 |
|  | b. | Describe holography and its principle in detail. Explain how will you construct a hologram with a help of a laser with a neat diagram | CO1 | 14 |
| 5. | a. | Explain the principle, structure and mode of propagation in optical fibre. | CO1 | 4 |
|  | b. | Find the numerical aperture and acceptance angle of an optical fiber if the refractive indices of core and cladding are 1.6 and 1.5 respectively. Also calculate the critical angle of the fiber. | CO1 | 6 |
|  | c. | Define refractive index. Explain the classification of optical fiber based on refractive index profile in detail. | CO1 | 10 |
| (OR) | | | | |
| 6. | a. | Describe briefly about the application of optical fiber in communication and fiber endoscope. | CO1 | 10 |
|  | b. | What do you mean by attenuation in optical fiber? Explain different losses in optical fiber. | CO1 | 10 |
| 7. | a. | Calculate the reverberation time of hall with volume of 1800 m3 and total absorption which is equivalent to 100 m2. | CO1 | 4 |
|  | b. | Write a short note on reverberation and reverberation time. | CO1 | 6 |
|  | c. | Explain threee different factors which affects the acoustics of the building and state how will you overcome it. | CO1 | 10 |
| (OR) | | | | |
| 8. | a. | Find the frequency of the ultrasonic wave generated by the oscillator if a ferromagnetic bar of length 15 cm and density 5.4 x 103 kg m-3 and Youngs modulus of the bar is 10.2 x 1011 Nm-2 is used. | CO1 | 4 |
|  | b. | How will you produce ultrasound using a ferromagnetic bar material? Explain the construction and working principle in detail with the magnetostriction oscillator diagram. | CO1 | 16 |
|  | | **Compulsory**: |  |  |
| 9. | a. | What is Meissner effect? Explain its uses in superconductors. | CO1 | 6 |
|  | b. | Briefly describe the concept of superconductors and its properties. Based on Meissner effect, exlain the types of superconductors in detail with its graph. | CO1 | 14 |

ALL THE BEST