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



**End Semester Examination – Nov-Dec– 2017**

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| **Code :** | **17PH1001** | **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. | What are matter waves? Write three properties. | CO1 | 4 |
| b. | Derive an expression for Schrodinger time independent wave equation. | CO1 | 16 |
| (OR) | | | | |
| 2. | a. | Calculate the deBroglie wavelength if the applied potential is 180 volts. | CO1 | 4 |
| b. | Find the eigen function and eigen values of a particle in an infinite one dimensional potential well using Schrödinger wave equation. | CO1 | 16 |
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| 3. | a. | What is stimulated emission? Explain with a diagram. | CO2 | 4 |
|  | b. | Explain the basic principle of He-Ne laser. Explain the construction and working of He-Ne with its energy level diagram. | CO2 | 16 |
| (OR) | | | | |
| 4. | a. | Draw the picture of an optical resonator and give short notes on the same. | CO2 | 4 |
|  | b. | Describe holography and its principle in detail. Explain in detail how will you construct and reconstruct a hologram with a help of a laser. | CO2 | 16 |
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| 5. | a. | A fiber has a diameter of 6 μm and its core refractive index is 1.57 and for cladding, it is 1.53. How many modes can propagate into the fiber if the wavelength of the source is 2.6 μm? | CO3 | 4 |
|  | b. | Define refractive index. Explain the classification of optical fiber based on different mode and refractive index profile in detail. | CO3 | 16 |
| (OR) | | | | |
| 6. | a. | Briefly describe the application of optical fiber in fiber endoscope. | CO3 | 4 |
|  | b. | What is acceptance angle and acceptance cone? Derive an expression for numerical aperture and acceptance angle with an adequate diagram. | CO3 | 16 |
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| 7. | a. | Calculate the reverberation time of hall with volume of 1400 m3 and total absorption which is equivalent to 90 m2of O.W.U. | CO4 | 4 |
|  | b. | Write short notes on reverberation and reverberation time. Explain the different factors affecting the acoustics of the building and mention the different ways to overcome it**.** | CO4 | 16 |
| (OR) | | | | |
| 8. | a. | Calculate the frequency of the ultrasonic wave generated by the oscillator if a ferromagnetic bar of length 18 cm and density 6.5 x 103 kg m-3 and Young’s modulus of the bar is 11.2 x 1011 Nm-2 is used. | CO4 | 4 |
|  | b. | What is magnetostriction effect? Explain the construction and working principle of the magnetostriction oscillator with the circuit diagram. | CO4 | 16 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Briefly describe Meissner effect with suitable diagram. | CO5 | 4 |
|  | b. | Briefly describe the concept of superconductors and its properties. Based on Meissner effect, explain the types of superconductors in detail with necessary graphs. | CO5 | 16 |