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 :** | **16PH1001** | **Duration :** | **3hrs** |
| **Sub. Name :** | **APPLIED PHYSICS FOR ENGINEERS** | **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. | Calculate the band gap energy for a GaAs semiconductor laser if the wavelength of laser emitted by it is 0.4141 μm. | CO1 | 3 |
| b. | Explain in detail how lasers are used for writing on a Compact Disc (CD) and reading a CD with essential digrams. | CO1 | 17 |
| (OR) | | | | |
| 2. | a. | The refractive indices for core and cladding of a fiber are 1.4452 and 1.4341 respectively. Calculate critical angle and numerical aperture. | CO1 | 3 |
| b. | How are optical fibers classified based on number of modes of transmission and their refractive index profile? | CO1 | 17 |
| 3. | a. | Elohim Auditorium has a volume of 1500 m3. its total absorption is equivalent to 150 m2 of open window. Find the reverberation time. | CO2 | 3 |
|  | b. | State any five factors affecting the acoustics of an auditorium and suggest few remedies for the same. | CO2 | 17 |
| (OR) | | | | |
| 4. | a. | Calculate the speed of ultrasound in mercury if the distance between two adjacent anti-nodes ‘d’ is 2.656 x 10-4 m and the frequency of the ultrasound produced is 2.73 x 106 Hz. | CO2 | 3 |
|  | b. | Define piezoelectric effect and inverse piezoelectric effect. Explain how the later is used to produce ultrasonic waves with a neat circuit diagram. | CO2 | 17 |
| 5. | a. | Calculate the de Broglie wavelength of an electron accelerated by a potential difference of 900 V. | CO3 | 3 |
|  | b. | Describe Davisson and Germer experiment to prove the concept of matter waves with neat diagrams. | CO3 | 17 |
| (OR) | | | | |
| 6. | a. | Explain how different colours are obtained with quantum dots briefly. | CO3 | 3 |
|  | b. | Discuss the principle, construction and working of a Scanning Electron Microscope with a neat sketch. | CO3 | 17 |
| 7. | a. | Name the two important aspects of a superconductor? | CO4 | 3 |
|  | b. | Explain the classification of superconductors based on their response to applied magnetic field. | CO4 | 17 |
| (OR) | | | | |
| 8. | a. | A magnetic field of certain strength produces a magnetic flux of 3 x 10-5 Weber in an iron bar of cross sectional area 0.2 x 10-4 m2. Calculate magnetic flux density. | CO4 | 3 |
|  | b. | Differentiate between dia, para, and ferromagnetic materials and tabulate the same. | CO4 | 17 |
|  | | **Compulsory**: |  |  |
| 9. | a. | State the three stages of indian nuclear power programme. | CO5 | 3 |
|  | b. | With a neat diagram, explain the various components of a nuclear reactor in detail. | CO5 | 17 |