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

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**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **19PH1012** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ENGINEERING PHYSICS - PROPERTIES OF MATTER, MECHANICS, LASERS AND FIBRE OPTICS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Course**  **Outcome** | **Marks** |
| **PART – A (10X1 = 10 MARKS)** | | | |
| 1. | The effect of temperature on the value of modulus of elasticity for various substances in general \_\_\_\_\_\_\_\_\_with rise in temperature. (increases / decreases) | CO1 | 1 |
| 2. | From the stress strain curve Hooke’s law is valid beyond the elastic limit. (say true or false) | CO1 | 1 |
| 3. | An object of mass 2Kg falls from a height of 20m above the ground. If acceleration due to gravity is 10m/s2, the loss of potential energy just before the mass strikes the ground is \_\_\_\_\_\_\_\_\_\_\_\_J. | CO2 | 1 |
| 4. | Define the laws of conservation of energy. | CO2 | 1 |
| 5. | A material has Poisson’s ratio of 0.2. If a uniform rod of it suffers longitudinal strain 4.0x10-3, calculate the lateral strain. | CO3 | 1 |
| 6. | Name the types of modulus of elasticitry. | CO3 | 1 |
| 7. | Give any two examples of linear harmonic oscillator. | CO4 | 1 |
| 8. | What are damped oscillations? | CO4 | 1 |
| 9. | What is the role of He in CO2 laser? | CO6 | 1 |
| 10. | Name the properties of laser. | CO6 | 1 |

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| **PART – B (6 X 3 = 18 MARKS)** | | | | | |
| 11. | Explain I Shaped Girders. | | CO1 | | 3 |
| 12. | Three masses 3,4 and 5Kg are placed at the corners of an equilateral triangle of side 1 metre. Find the centre of mass of the system. | | CO2 | | 3 |
| 13. | Draw the stress-strain curve and give its significance. | | CO3 | | 3 |
| 14. | Does the equation d2x/dt2=(3/2)x represents a linear harmonic oscillator? Ascertain the values of the restoring force constant(K)and mass (M) of the particle. | | CO4 | | 3 |
| 15. | Distinguish stimulated from spontaneous emission. | | CO6 | | 3 |
| 16. | A step index fibre has a core refractive index of 1.5, if the numerical aperture of the fibre is 0.26. Calculate the refractive index of the cladding material. | | CO5 | | 3 |
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| **PART – C (6 X 12 = 72 MARKS)**  **(Answer any five Questions from Q.no 17 to 23. Q.No 24 is a Compulsory Question)** | | | | | |
| 17. |  | With necessary theory, explain cantilever experiment of length L and carrying load W at the free end. | CO1 | 12 | |
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| 18. | a. | State and Prove the work energy theorem. | CO2 | 6 | |
| b. | Explain the principle of conservation linear momentum. Show that the linear momentum of a system of particle remains constant in the absence of any external force acting on it. | CO2 | 6 | |
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| 19. |  | Obtain the relation between the elastic constants. | CO3 | 12 | |
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| 20. | a. | Show that the simple pendulum is convenient method for measuring the value of aceleration due to gravity. | CO4 | 8 | |
| b. | Explain how periodic motion is related to the potential energy of a particle. | CO4 | 4 | |
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| 21. |  | Describe the construction and working of a semiconductor laser with a neat sketch. | CO6 | 12 | |
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| 22. |  | Explain how will you determine the Rigidity modulus of the wire by using Torsional Pendulum. | CO1 | 12 | |
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| 23. |  | Summarize the construction and Reconstruction of Hologram with suitable diagram. | CO6 | 12 | |
|  |  | **Compulsory:** | |  | |
| 24. | a. | With block diagram, explain optical fibre communication system. | CO5 | 8 | |
| b. | List the possible losses in optical fibre. | CO5 | 4 | |