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 :** | **14PH2006** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MECHANICS AND PROPERTIES OF MATTER** | **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. | Define escape velocity. Show that the escape velocity from the surface of the earth is equal to 11.2 ms/s. | CO1 | 4 |
| b. | Determine the gravitational constant G using Cavendish method with neat diagram and deduce the equation. State few of its advantages and drawbacks. | CO3 | 16 |
| (OR) | | | | |
| 2. | a. | State and prove Kepler’s second law of planetary motion. | CO1 | 6 |
| b. | Define and explain gravitational potential. Derive an expression for gravitational potential at a point inside and outside a thick solid sphere. | CO1 | 14 |
| 3. | a. | An artificial satellite is placed in a stable circular orbit above the equator such that it remains stationary with respect to an observer on the earth. What is the radius of its orbit? | CO1 | 4 |
|  | b. | Calculate the general equation for the motion of a projectile in a non-resisting medium. Derive the expressions for (i) maximum height and (ii) maximum range. | CO1 | 16 |
| (OR) | | | | |
| 4. | a. | Distinguish between elastic and inelastic collisions with suitable examples. | CO2 | 6 |
|  | b. | Explain the loss of kinetic energy on impact between two different bodies and find out their relative masses. | CO2 | 14 |
| 5. |  | Define the elastic constants. Establish the relations between all the three types of modulus of elasticity. | CO2 | 20 |
| (OR) | | | | |
| 6. | a. | Describe briefly about Poisson’s ratio. | CO1 | 6 |
|  | b. | Find out the value of Poisson’s ratio of a wire of length L and diameter D fixed at one end and a force is applied at the other end. | CO3 | 14 |
| 7. |  | Explain the Poiseuille’s method for finding the coefficient of viscosity of liquids with adequate diagram. | CO3 | 20 |
| (OR) | | | | |
| 8. | a. | Describe surface tension in detail with examples. | CO2 | 8 |
|  | b. | A rectangular beam is kept over two knife edges equal distances apart. Derive an expression for the depression when masses are loaded at their ends. | CO3 | 12 |
|  | | **Compulsory:** |  |  |
| 9. |  | What is Stoke’s method. How will you determine the co-efficient of viscosity of a highly viscous liquid using this method? | CO3 | 20 |

ALL THE BEST