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 – Nov/Dec – 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **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. | Two spheres of mass 20 g and 1100 g are placed 3 cms apart and they attract each other with the force equal to 1.6 x 10 -9 N.  Find the value of gravitational constant in S.I units. | CO1 | 6 |
| b. | Determine the gravitational constant G using Cavendish method with neat diagram and deduce the equation. Mention few of its drawbacks. | CO3 | 14 |
| (OR) | | | | |
| 2. | a. | Derive an expression for the acceleration due to gravity ‘g’ from Newton’s law of gravitation. | CO1 | 6 |
| b. | Describe all three Kepler’s law of planetary motion in detail with adequate diagram. | CO1 | 14 |
| 3. | a. | Define escape velocity. Show that the escape velocity from the surface of the earth is equal to 11.2 m/s. | 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. | Define impulse with examples and obtain its expression. | CO2 | 6 |
|  | b. | Explain the loss of kinetic energy on impact between two different bodies and find out their relative masses. | CO2 | 14 |
| 5. | a. | A steel wire of 22 m long and 5 mm diameter is attached to the ceiling and 310 N weight is attached at the end of the steel wire. What is the applied stress? | CO2 | 4 |
|  | b. | Write a short note on Young’s modulus and shear modulus. | CO2 | 6 |
|  | c. | Briefly explain laws of impact and coefficient of restitution. | CO2 | 10 |
| (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. | What is angle of contact in liquid? Determine the angle of contact for mercury in a glass tube with necessary diagram. | CO3 | 12 |
|  | | **Compulsory:** |  |  |
| 9. |  | Determine the co-efficient of viscosity of a highly viscous liquid using Stoke’s method. | CO3 | 20 |