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



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

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| **Code :** | **17PH2001** | **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. | Describe Cavendish method in detail for determining the gravitational constant. | CO1 | 16 |
| b. | Two spheres of masses 33g and 780g respectively and 9.0 cm apart attract each other with a force of 5.1 x 10-9 N. Find the value of gravitational constant in SI. | CO1 | 4 |
| (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. | Explain how the range, height and angle of a projectile can be measured and discuss the range on an inclined plane. | CO1 | 16 |
|  | b. | A cricket ball is thrown upward from the top of a building at an angle of 62 degrees above the horizontal and with an initial speed of 44 m/s. If the brick is in the air for 9 seconds, how high is the mountain? | CO1 | 4 |
| (OR) | | | | |
| 4. | a. | What is a projectile? Define its trajectory. | CO1 | 4 |
|  | b. | Explain the loss of kinetic energy on impact between two different bodies and find out their relative masses. | CO2 | 16 |
|  |  |  |  |  |
| 5. | a. | Describe in detail about the collision between two elastic bodies | CO2 | 10 |
|  | c. | Derive the relation between the three modulus of elasticity (K,Y, n) | CO2 | 10 |
| (OR) | | | | |
| 6. |  | A thin uniform bar of rectangular cross section is supported at its ends on two knife edges and loaded in the middle. Derive an expression for the depression of the mid-point of the beam for a load W by neglecting the mass of the beam. | CO3 | 20 |
|  |  |  |  |  |
| 7. | a. | Derive the bending moment of the beam keeping one end of the beam fixed to a wall and other end free. | CO1 | 6 |
|  | b. | Explain cantilever? Obtain an expression for the depression produced at its free end when the weight of the beam is negligible. | CO3 | 14 |
| (OR) | | | | |
| 8. | a. | Distinguish between mass of a body and the moment of inertia of a body. | CO1 | 6 |
| b. | What is angle of contact in liquid? Determine the angle of contact for mercury in a glass tube with necessary diagram. | CO3 | 14 |
|  | | **Compulsory:** |  |  |
| 9. |  | Define viscosity. Explain the Poiseuille’s method in detail for finding the coefficient of viscosity of liquids | CO3 | 20 |

ALL THE BEST