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

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

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| **Code :** | **17PH1003** | **Duration :** | **3hrs** |
| **Sub. Name :** | **PHYSICS FOR AGRICULTURAL ENGINEERS** | **Max. Marks :** | **100** |

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| **Q. No.** | **Questions** | **Course Outcome** | **Marks** |
| **PART – A (20 X 1 = 20 MARKS)** | | | |
| 1. | A bullet is fired from ground level with a speed of 150 m/s at an angle 30 degree above the horizontal at alocation where g = 10.0 m/s2. What is the vertical component of its velocity when it is at the highest point of its trajectory? | CO2 | 1 |
| 2. | If the initial speed of a projectile is doubled, its range will be a \_\_\_\_\_\_\_\_\_. | CO2 | 1 |
| 3. | The Coefficient of Restitution normally ranges from 0 to 1. If the collision is perfectly inelastic, then the Coefficient of Restitution is \_\_\_\_\_\_\_\_\_. | CO3 | 1 |
| 4. | The unit of impulse is \_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 5. | The ratio of lateral contraction to longitudinal strain, when a body undergoes a linear tensile strain is called as \_\_\_\_\_\_\_\_\_\_. | CO6 | 1 |
| 6. | State Hooke’s law. | CO6 | 1 |
| 7. | The inability of a body to change, by itself, its position of rest, or of uniform motion is called as \_\_\_\_\_\_\_\_\_\_. | CO5 | 1 |
| 8. | Define Radius of Gyration. | CO1 | 1 |
| 9. | What is a cantilever? | CO1 | 1 |
| 10. | Expression for bending moment of a beam is given by YR/Ig. (True or false). | CO5 | 1 |
| 11. | A metallic beam is fixed at ends and a load is suspended in the middle. The depression of the beam and the young’s modulus are \_\_\_\_\_\_\_\_ proportional (directly / Inversely). | CO4 | 1 |
| 12. | A beam is a rod of uniform cross section whose length is much \_\_\_\_\_\_\_\_ as compared to its other dimensions (greater / smaller / equal). | CO4 | 1 |
| 13. | The velocity profile of a liquid flowing in a capillary tube is \_\_\_ \_\_\_\_\_\_. | CO4 | 1 |
| 14. | The unit of coefficient of viscocity is \_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 15. | What is stream line flow? | CO1 | 1 |
| 16. | Is poiseuille’s formula valid for gases or liquids or both the liquids and gas. | CO3 | 1 |
| 17. | The spherical shape of a rain drop is due to \_\_\_\_\_\_\_\_\_\_. | CO1 | 1 |
| 18. | A value of surface tension of 70 dynes /cm is equal to \_\_\_\_\_\_\_\_\_\_ N/m. | CO2 | 1 |
| 19. | Give the effect of surface tension when temperature increases. | CO1 | 1 |
| 20. | Which among the three has more surface tension \_\_\_\_\_\_\_ (Water, Oil and gas). | CO3 | 1 |

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| **PART – B (10 X 5 = 50 MARKS)**  **(Answer any 10 from the following)** | | | |
| 21. | Explain elastic and inelastic collision with example. | CO6 | 5 |
| 22. | A body is projected upward at an angle of 300 with the horizontal with an initial speed of 39m/s. In how many seconds will it reach the grounds? How far from the point of projection will it strike? | CO2 | 5 |
| 23. | Explain Coefficient of restitution. | CO1 | 5 |
| 24. | Draw stress-strain diagram and explain. | CO3 | 5 |
| 25. | Explain Bulk Modulus and Rigidity modulus with unit. | CO2 | 5 |
| 26. | A 1Kg stone is attached to the end of a 60 cm chain at the rate of  3 revolutions / sec. What is the angular momentum? If after 30sec, it is making only one revolution per second, find the mean torque. | CO6 | 5 |
| 27. | Obtain an expression for bending moment of a beam. | CO2 | 5 |
| 28. | The end of a given strip cantilever depresses 10mm, under a certain load. Calculate the depression under the same load for another cantilever of same material, two times in length, two times in width and three times in thickness (vertical). | CO5 | 5 |
| 29. | Outline the experiment to determine the surface tension of the given liquid. | CO4 | 5 |
| 30. | In a Poiseuillie’s experiment the following readings were observed. Volume of the alcohol (density =8x102 Kg/m3) flowing per second =10-5 /60 m3, length of the tubes 0.5m, radius of the tube is 0.05cm, height of the alcohol head is 0.6m. Determine the coefficient viscosity for alcohol. | CO2 | 5 |
| 31. | State and explain Bernoulli’s theorem and give its applications. | CO4 | 5 |
| 32. | Define Surface tension. How it is related to surface energy? What are the dimensions of surface tension. | CO1 | 5 |

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| **PART – C (2 X 15 = 30 MARKS)**  **(Answer any 2 from the following)** | | | |
| 33. | Define Young’s Modulus. Describe with necessary theory to determine the Young’s modulus of the given material by Uniform bending. | CO4 | 15 |
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| 34. | Define coefficient of viscosity. Obtain Poiseuillie’s equation for the rate of flow of liquid through a capillary tube. | CO2 | 15 |
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| 35. | State and explain Parallel axis theorem and perpendicular axis theorem of moment of Inertia. | CO5 | 15 |