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



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

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| **Code :** | **16AE2005** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INDUSTRIAL AERODYNAMICS** | **Max. Marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | Explain the following   1. Structure of wind 2. Terrain and the dynamics of wind over the terrain 3. Variation of wind speed with height in an open terrain 4. Gust | CO1 | 5  5  5  5 |
| **(OR)** | | | | |
| 2. | a. | A wind of 10 m/s is blowing over a level ground at the foot of a hill. Draw the variation of the wind speed over the hill starting from the top of the hill to a height of 50 ft. State your assumptions very clearly. | CO1 | 10 |
| b. | Discuss the structure of turbulent flow with a neat sketch. | CO1 | 10 |
|  |  |  |  |  |
| 3. | a. | Derive the expression of the available (total) wind power interms of wind speed of V, and diameter D of a horizontal axis wind machine. | CO1 | 10 |
|  | b. | Distinguish between horizontal and vertical axis wind turbine. | CO1 | 10 |
| **(OR)** | | | | |
| 4. | a. | Discuss about separation and reattachment of flow and also its four controlling variables with an example. | CO1 | 14 |
|  | b. | Explain the importance of Betz coefficient. | CO1 | 6 |
|  |  |  |  |  |
| 5. | a. | Derive the expression of power required to move the car with suitable assumptions. | CO2 | 14 |
|  | b. | Illustrate the working principle of hovercraft with a neat diagram. | CO2 | 6 |
| **(OR)** | | | | |
| 6. | a. | Explain in detail about drag reduction methods in a road vehicle. | CO2 | 14 |
|  | b. | Discuss any two aerodynamic challenges on train and also its preventive measures. | CO2 | 6 |
|  |  |  |  |  |
| 7. | a. | Construct the design of high rise buildings and low rise buildings. | CO3 | 14 |
|  | b. | Describe about vortex shedding . | CO3 | 6 |
| **(OR)** | | | | |
| 8. | a. | Compare ventilation and architectural aerodynamics with neat sketches. | CO3 | 14 |
|  | b. | Discuss about the building codes and its significance. | CO3 | 6 |
|  | | **Compulsory**: |  |  |
| 9. |  | Write short notes on:   1. Building ventilation. 2. Environmental winds in city blocks | CO3 | 10  10 |