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– 2017**

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| **Code :** | **15ME3002** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ROTOR DYNAMICS** | **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. | Derive the equation of motion and solution for torsional vibration in rotating machinery for single degree of freedom. | CO1 | 15 |
| b. | Write short note about the softwares used in rotating machinery for analysis. | CO3 | 5 |
| (OR) | | | | |
| 2. | a. | With example, discuss the different parts of a rotor system. | CO1 | 10 |
| b. | Explain how rotor dynamics differs from the conventional structural dynamics? | CO1 | 10 |
|  |  |  |  |  |
| 3. |  | With neat sketch, explain how vibration signals generated in rotor system are measured and displayed. | CO3 | 20 |
| (OR) | | | | |
| 4. |  | How rubs are produced in rotating machinery and elaborate the types of rub. Also describe how fault due to rubbing can be avoided in rotating machines. | CO3 | 20 |
|  |  |  |  |  |
| 5. |  | Explain Single-DOF damped rotor model and discuss the different cases of damping. | CO1 | 20 |
| (OR) | | | | |
| 6. |  | With illustration, explain how self excited vibrations causes instability in rotating machineries. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | Explain the concept of ‘shaft bow’ in rotor dynamics. | CO3 | 10 |
|  | b. | Derive the required mathematical expression for unbalance response and bow response amplitudes in a shaft bow model. | CO3 | 10 |
| (OR) | | | | |
| 8. |  | Explain Undamped rotor model for a single degree of freedom and derive suitable expression for free and forced vibration response. | CO2 | 20 |
|  | |  |  |  |
|  | | **Compulsory**: |  |  |
| 9. |  | With necessary equations and illustrations, explain steady state response in a Jeffcott rotor model. | CO1 | 20 |

ALL THE BEST