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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

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

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **12AE209** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **WIND TUNNEL TECHNIQUES** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | | **Marks** |
| **PART-A(10X1=10 MARKS)** | | | |
| 1. | Define Mach Number. | | 1 |
| 2. | Define Reynolds Number. | | 1 |
| 3. | Define Path line. | | 1 |
| 4. | Define Time Line. | | 1 |
| 5. | What are the classifications of balances? | | 1 |
| 6. | What are the forces and moments acting on a model in a wind tunnel? | | 1 |
| 7. | What do you understand by starting loads? | | 1 |
| 8. | Write any two advantages claimed for the Indraft tunnel. | | 1 |
| 9. | What does unlike Schlieren, Shadowgraph technique does not have? | | 1 |
| 10. | Mention the type of mirror used in Schlieren technique? | | 1 |
| **PART B(5 X 3= 15 MARKS)** | | | |
| 11. | Write the advantages and disadvantages of open return wind tunnel. | | 3 |
| 12. | Write how can the velocity in the test section of the tunnel can be found out. | | 3 |
| 13. | Write any three balance requirements. | | 3 |
| 14. | Mention any three parameters that effect the sizing of the model in the tunnel. | | 3 |
| 15. | Write short notes on PIV. | | 3 |
| **PART C(5 X 15= 75 MARKS)** | | | |
| 16. |  | Give a detail description about the parts and working principle of open circuit subsonic wind tunnel. | 15 |
| (OR) | | | |
| 17. |  | Explain about continuous and intermittent wind tunnels with a neat sketch. | 15 |
| 18. | a. | Write short notes on the following direct flow visualization techniques in low speed wind tunnels using smoke flow visualization. | 8 |
| b. | Write short notes on the following direct flow visualization techniques in low speed wind tunnels using tuft flow visualization. | 7 |
| (OR) | | | |
| 19. |  | Write in detail about the boundary layer measurements in the test section. | 15 |
| 20. |  | Explain the concept of a six component balance with a neat sketch. | 15 |
| (OR) | | | |
| 21. | a. | Write short notes on single strut model mounting arrangement. | 5 |
| b. | Write short notes on two strut model mounting arrangement. | 5 |
| c. | Write short notes on three point model mounting arrangement. | 5 |
| 22. | a. | How do the air flow rate are calculated in case of intermittent blow down type tunnels? | 8 |
| b. | How do run time calculations are calculated in case of intermittent blow down type tunnels? | 7 |
| (OR) | | | |
| 23. |  | Explain the working of shock tube with neat sketch. | 15 |
| 24. | a. | Write a short notes on Pressure sensitive paints. | 8 |
| b. | Write a short notes on Temperature sensitive paints. | 7 |
| (OR) | | | |
| 25. | a. | Write short notes on Schlieren flow visualization technique used in supersonic wind tunnel. | 8 |
| b. | Write short notes on Shadowgraph flow visualization technique used in supersonic wind tunnel. | 7 |

ALL THE BEST