**B.E / B.Tech./B.Arch. PRACTICAL END SEMESTER EXAMINATIONS, NOVEMBER / DECEMBER 2019**

Fifth Semester

**ME8511 & KINEMATICS AND DYNAMICS LABORATORY**

(Regulations 2017)

Time : 3 Hours Answer any one Question Max. Marks 100

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| **Aim/Principle/Apparatus required/Procedure** | **Tabulation/Circuit/Program/Drawing** | **Calculation & Results** | **Viva-Voce** | **Record** | **Total** |
| **20** | **20** | **40** | **10** | **10** | **100** |

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| 1. | Determine the gear ratio for the following gear trains theoretically and very the results experimentally: (i) Differential gear train (ii) Compound gear train (iii) Epicyclic gear train. |
| 2. | Determine the gear ratio for the following gear trains theoretically and very the results experimentally: 1. Spur gear train (ii) Universal joint. |
| 3. | Determine the radius of gyration and mass moment of inertia of the circular disc theoretically and verify the results experimentally using the Turntable apparatus. |
| 4. | Determine the active and reactive gyroscopic couples and plot the graph for the following  1.Active Vs Reactive couple. 2.Weight added Vs Reactive couple. |
| 5. | Find the range of sensitivity for the following governors 1.Proell governor,2. Hartnell governor. |
| 6. | Study the characteristics of and draw the characteristics curves of the following governors for 1.Watts governor 2.Porter governor. |
| 7. | Determine the natural frequency using whirling of shaft with load and without load conditions. |
| 8. | Conduct an experiment on the Bifilar suspension system and determine the mass Moment of Inertia of the given rod |
| 9. | Draw the frequency response curves for damped and undamped vibration and determine the transmissibility ratio using vibrating table. |
| 10. | Calculate the undamped natural frequency using spring mass system. |
| 11. | Calculate the natural frequency of transverse vibration of cantilever beam and plot the graph for the following 1.Draw the characteristics curves of load Vs Displacement, Natural frequency. 2. Draw the characteristics curves of Displacement Vs Natural frequency. |
| 12. | Determine the period and frequency of torsional vibration of single rotor system and compare the experimental values with theoretical values. |
| 13. | Calculate the radius of gyration, mass moment of Inertia of compound pendulum for the rectangular rod. |
| 14. | Find the jump-speed characteristics of cam follower mechanism and draw the graph for load Vs Jump speed |
| 15. | Draw the couple polygon and force polygon for balancing of rotating masses. |
| 16. | Determine the natural frequency of free transverse vibration of a steel shaft with cantilever condition subject to uniformly distrusted load and concentrated load. Compare the results with theoretical frequency values. |
| 17. | Two known masses of 300g and 400g are placed in plane A and plane C at angular positions of 45° and 270° respectively. Take the distance between planes A and B = 250 mm; the distance between planes C and B = 150 mm and the distance between planes D and B = 340 mm. The radii of rotation of masses in planes A, B, C and D are 67 mm, 118 mm, 118 mm and 67 mm respectively. Determine the balancing masses to be added and their angular positions at planes B and D using force and couple polygon and verify the answer experimentally. |
| 18. | Find the displacement, velocity and acceleration using vibration analysis and plot the graph for the following 1.Frequency Vs Displacement 2.Frequency Vs Velocity 3.Frequency Vs Acceleration. |
| 19. | Conduct a damped vibration test on the Two rotor set up and determine the damped natural frequency of the system. Draw the following graph 1. Depth of immersion Vs torsional Natural frequency. |
| 20. | Determine the natural frequency of the spring-mass- damper system for various loads and find the critical damping coefficient. Compare the experimental results with theoretical frequency values. |