

Assignment 1

Balancing Of Rotating Masses

1. What is meant by static & dynamic unbalance in machinery?
2. Explain balancing of single mass by single masses rotating in same planes?
3. Explain balancing of single mass by two masses rotating in different planes?
4. Explain balancing of several masses rotating in same planes?
5. Explain balancing of several masses rotating in different planes?
6. Explain the concept of bearing reaction?

Assignment 2

Balancing Of Reciprocating Masses

1. Explain concept of shaking forces?
2. Explain primary and secondary unbalanced forces of reciprocating masses?
3. Explain partial balancing of unbalanced primary forces in reciprocating masses?
4. Explain the following terms: (i) Hammer blow (ii) Swaying couple (iii) Variation in tractive force.
5. Explain primary and secondary balancing forces of multi-cylinder inline engine?
6. Explain balancing of radial engines (Direct and reverse crank method)?
7. Explain balancing of V-engines?

Assignment 3

Mechanical Vibrations

1. Classify and explain types of vibration?
2. Define following terms (i) Period of vibration (ii) Cycle (iii) Frequency (iv) Resonance (v) Degree of freedom (vi) Simple harmonic motion?
3. Explain equivalent stiffness of spring in series and parallel connection?
4. Derive equation of natural frequency using equilibrium method or free body diagram method?
5. Derive equation of natural frequency using law of conservation of energy?
6. Explain frequency of free damped vibration (i) viscous damping (ii) coulomb damping?
7. Derive equation of motion for viscous damper?
8. Explain (i) Critical damping coefficient (ii) Damping factor (iii) Logarithmic decrement?
9. Explain analysis of forced damped system?
10. Explain (i) Magnification factor (ii) Force transmissibility (iii) Vibration isolation?
11. Explain effect of base excitation?

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Assignment 4

Torsional Vibrations

1. Equation of motion and principal mode of torsional vibration for two and three rotor system?
2. Explain concept torsional equivalent shaft system.
3. Explain concept torsional equivalent geared system.
4. Explain the whirling of shaft?

Assignment 5

Vibration Measurements

1. Explain the Vibrometer?
2. Explain the Velocity pickup?
3. Explain the Accelerometer?
4. Explain the FFT spectrum analyzer?

Assignment 6

Cam Dynamics

1. Derive the dynamic analysis of force closed cam follower system?
2. Explain the jumping phenomenon concept?
3. Explain the effect of jumping phenomenon on spring force and dead weights?