

DYNAMICS OF MACHINES

Written by Administrator
Sunday, 01 November 2009 10:44 -

Subject Code

:

06ME53

IA Marks

:

25

No. of Lecture Hrs./ Week

:

04

Exam Hours

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:

03

Total No. of Lecture Hrs.

:

52

Exam Marks

:

100

PART - A

Unit - 1

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Static Force Analysis: Static Force Analysis: Introduction: Static Equilibrium. Equilibrium of Two and Three Force Members. Members with Two Forces and Torque, Free Body Diagrams, Principle of Virtual Work. Static Force Analysis of Four Bar Mechanism and Slider-Crank Mechanism with and without friction.

6 Hours

Unit - 2

Dynamic Force Analysis: D'Alembert's Principle, Inertia Force, Inertia Torque, Dynamic Force Analysis of Four-Bar Mechanism and Slider Crank Mechanism. Dynamically Equivalent Systems. Turning Moment Diagrams and Flywheels, Fluctuation of Energy. Determination of size of flywheels.

8 Hours

Unit - 3

Friction and Belt Drives: Definitions: Types of Friction: Laws of friction, Friction in Pivot and Collar Bearings. Belt Drives: Flat Belt Drives, Ratio of Belt Tensions, Centrifugal Tension, Power Transmitted.

6 Hours

Unit - 4

Balancing of Rotating Masses: Static and Dynamic Balancing, Balancing of Single Rotating Mass by Balancing Masses in Same plane and in Different planes. Balancing of Several Rotating Masses by Balancing Masses in Same plane and in Different planes.

6 Hours

PART - B

Unit - 5

Balancing of Reciprocating Masses: Inertia Effect of Crank and Connecting rod, Single Cylinder Engine, Balancing in Multi Cylinder-inline engine (Primary & Secondary forces), V-type Engine; Radial Engine – Direct and Reverse Crank Method.

8 Hours

Unit - 6

Governors: Types of Governors; Force Analysis of Porter and Hartnell Governors. Controlling Force, Stability, Sensitiveness, Isochronism, Effort and Power

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6 Hours

Unit - 7

Gyroscope: Vectorial Representation of Angular Motion, Gyroscopic Couple. Effect of Gyroscopic Couple on Ship, Plane Disc, Aeroplane, Stability of Two Wheelers and Four Wheelers.

6 Hours

Unit - 8

Analysis of CAMS: Analysis of Tangent Cam with Roller Follower and Circular Arc Cam Operating Flat Faced and Roller Followers, Undercutting in Cams.

6 Hours

Text Books:

1. **Theory of Machines:** Sadhu Singh, Pearson Education, 2nd edition, 2007.
2. **Theory of Machines:** Rattan S.S. Tata McGraw Hill Publishing Company Ltd., New Delhi, 2nd Edition, 2006.

Reference Books:

1. **Theory of Machines**, Thomas Bevan, CBS Publication 1984.
2. **Design of Machinery**, Robert L. Norton, McGraw Hill, 2001.
3. **Mechanisms and Dynamics of Machinery**, J. Srinivas, Scitech Publications, Chennai, 2002.