AMAE-17 VEHICLE DESIGN DATA CHARACTERISTICS

UNIT-1 INTRODUCTION
1.1 Assumptions to be made in designing a vehicle,
1.2 Range of values for Gross Vehicle Weight,
1.3 Frontal Area,
1.4 Maximum speed,
1.5 Maximum acceleration,
1.6 Gradability in different gears,
1.7 Basics of Automobile Design.

UNIT-2 RESISTANCE TO VEHICLE MOTION
2.1 Calculation,
2.2 Tabulation and Plotting of Curves for Air and Rolling Resistances at various vehicle speeds,
2.3 Calculation and Plotting of Driving force,
2.4 Power requirement for different loads and acceleration,
2.5 Maximum Power calculation.

UNIT-3 PERFORMANCE CURVES-I
3.1 Calculation,
3.2 Tabulation and Plotting of Torque and Mechanical Efficiency for different vehicle speeds,
3.3 Interpolation of Pressure
3.4 Volume diagram,
3.5 Calculation of frictional Mean Effective Pressure,
3.6 Calculation of Engine Cubic Capacity,
3.7 Bore and Stroke Length.

UNIT-4 PERFORMANCE CURVES-II
4.1 Connecting rod length to Crank Radius Ratio,
4.2 Plotting of Piston Velocity and Acceleration against Crank Angle,
4.3 Plotting Gas force,
4.4 Inertia force and Resultant force against Crank Angle,
4.5 Turning Moment and Side Thrust against Crank Angle.

UNIT-5 GEAR RATIOS
5.1 Determination of Gear Ratios,
5.2 Acceleration and Gradability,
5.3 Typical Problems on Vehicle performance

Reference Book:
1. Gupta. R.B., "Automobile Engineering", Sathya Prakashan, 8 edu. 2013.