

Ques 2 Couple 1.7

A couple is a pair of forces, equal in magnitude, oppositely directed and displaced by perpendicular distance or moment.

The simplest kind of couple consists of two equal & opposite forces whose lines of action do not coincide. This is called a "simple couple". The forces have a turning effect or moment called a torque about an axis which is normal (perpendicular) to the plane of the forces. The SI unit for the torque of the couple is newton meter.

If the two forces are F and F then the magnitude of the torque is given by the following formula

$$\tau = Fd$$

where

τ is the torque

F is the magnitude of one of the forces

d is the perpendicular distance between the forces, sometimes called the arm of the couple.

The main characteristics of couple:-)

1. The algebraic sum of the forces having the couple is zero.
2. The algebraic sum of moment of the forces constituting couple about any point is the same & equal to the moment of couple itself.
3. A couple can't be balanced by a single force but can be balanced only by a couple, however of opposite sense.
4. Any number of coplanar couples can be reduced to single couple whose magnitude will be equal to algebraic sum of moments of all the couples.