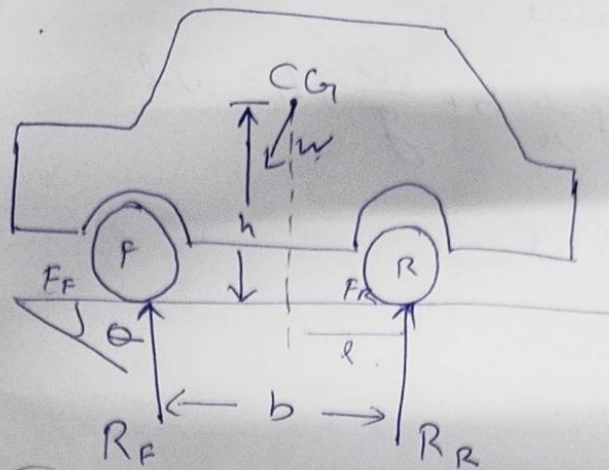


Q1)

AKASH-A
ASSIGNMENT-2

$$W \sin \alpha = F_F + F_R$$

$$W \cos \alpha = R_F + R_R$$

$$\sum M_F = 0$$

$$W h \sin \alpha + R_R b = W (b-l) \cos \alpha$$

$$R_R = \frac{W}{b} [(b-l) \cos \alpha - h \sin \alpha]$$

$$R_F = W \cos \alpha - R_R$$

$$= W \cos \alpha - W \cos \alpha + \frac{W l}{b} \cos \alpha + \frac{W h}{b} \sin \alpha$$

$$\frac{W \cos \alpha}{b} [l \cos \alpha + h \sin \alpha]$$

Traction effort

μ = Coefficient of adhesion b/w tyre & surface.

Maximum traction effort $F_F = \mu R_F$ produces maximum forward acceleration.

$\sum H = 0$ gives

$$W = R_F + R_R$$

$$F_F = \mu R_F = \frac{\mu W}{g} g$$

$\sum M_R = 0$ gives

$$R_F b + \frac{\mu W}{g} g h = W l$$

Searchi tute R_F value .

$$\cancel{R_F} \frac{w}{g} f \frac{1}{u} b + \frac{w}{g} fh = wl .$$

$$\frac{f}{g} \left(\frac{b}{u} + h \right) = l$$

$$\therefore \frac{f}{g} = \frac{ul}{b+uh} .$$

Solving $R_F \neq R_R$

$$R_F = \frac{l}{b+uh} w$$

$$R_R = \frac{b-l+uh}{b+uh} w$$

Q2) $m = 1765 \text{ kg}$
 $L = 2.84 \text{ m}$
 $a_1 = 1.22 \text{ m}$
 $a_2 = 1.62 \text{ m}$

$$F_{zf} = mg \frac{a_2}{L} \rightarrow \text{front axle.}$$

$$F_{zr} = mg \frac{a_1}{L} = \text{rear axle.}$$

$$L = a_1 + a_2$$

$$F_{zf} = 1765 \times \frac{1.62}{2.84}$$

$$= \underline{\underline{1006.795 \text{ N}}}$$

$$F_{zr} = 1765 \times \frac{1.22}{2.84}$$

$$= \underline{\underline{758.204 \text{ N}}}$$

Q3) Parts of a tyre are.

Shoulder
Tread blocks
Grooves
voids
Sipes
Steel belts
Radial plies
Side wall
Apex
Bead

~~There are~~

bias ply tyres

- This type of tyre offer a smooth ride quality on uneven surfaces with improved driving comfort.
- The bias construction tyres are also capable of bearing higher loads which is why they are most helpful in heavy machinery.
- They are less susceptible to damage and much easier to repair.
- Provides less grip at higher speeds.

Radial tyres

- These tyres provide a shorter and wider footprint it also means low rolling resistance which in turn consumes less fuel and increase efficiency.

Moreover the radial tyres offer enhanced grip and improved ride comfort at high speed.

As the tyre construction uses steel cords there is no movement between the plies and this allows increased resistance to heat or lesser heat build up.