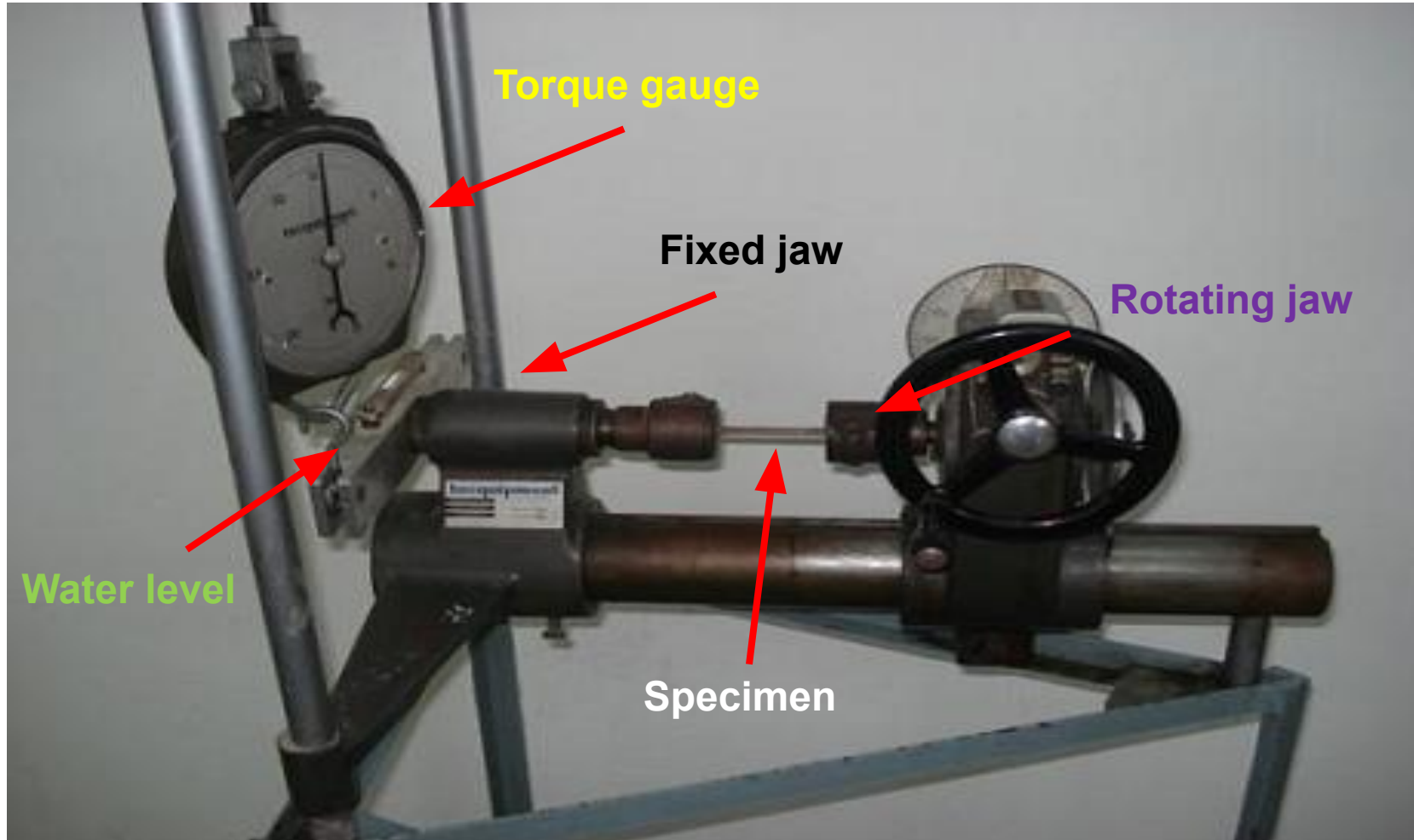


Experiment 5

Torsion Until Fracture



Torque gauge

Fixed jaw

Rotating jaw

Water level

Specimen

$$\frac{T}{J_P} = \frac{G \times \theta}{L} = \frac{\tau}{r}$$

T = torque or twisting
moment

J_p = polar moment of inertia

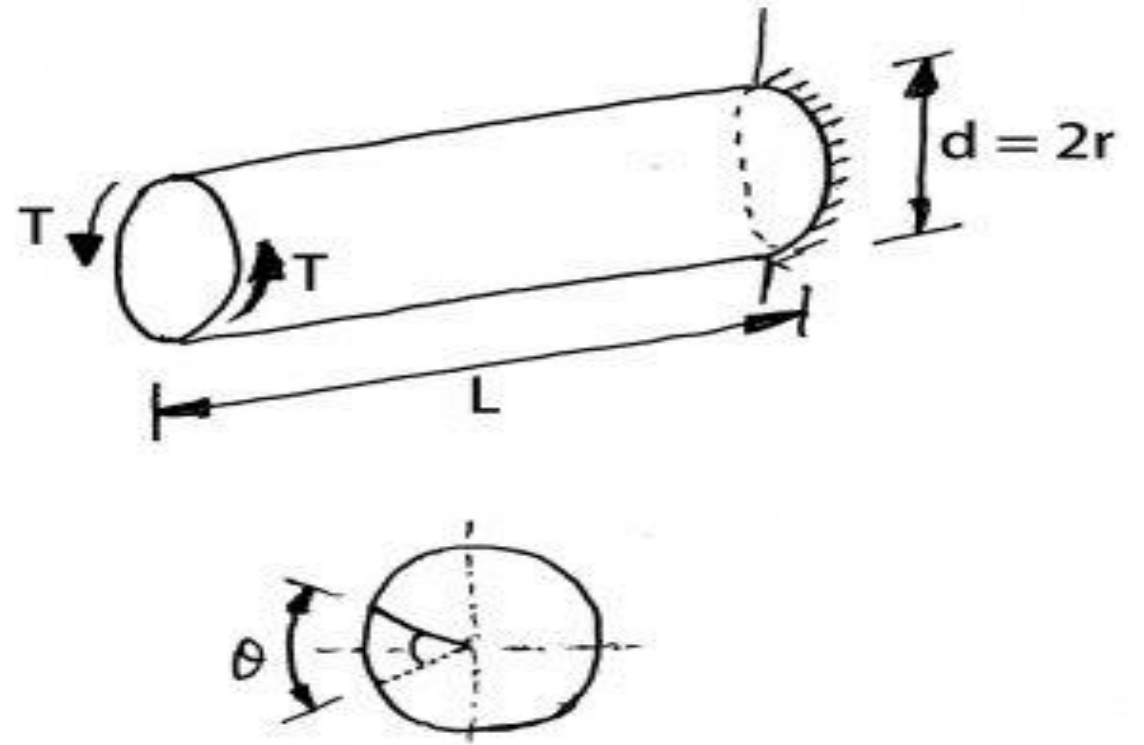
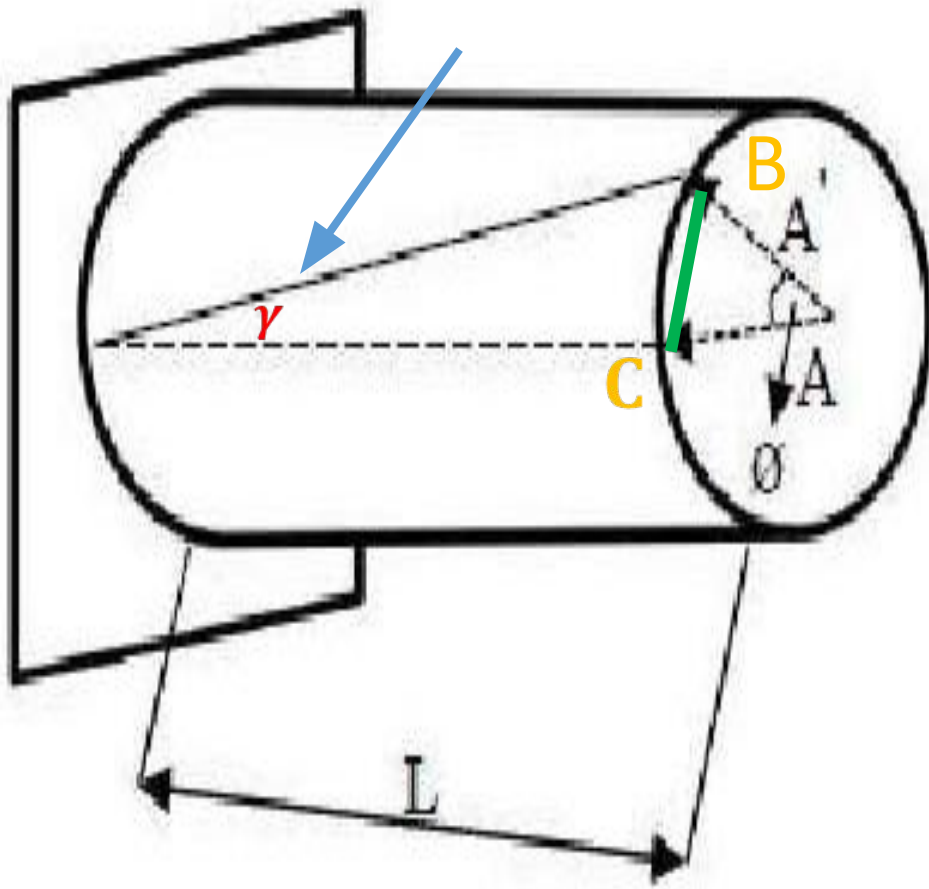
G = modulus of
rigidity

θ = angle of twist, [rad]

L = length of the shaft

τ = shear stress

r = radius of the shaft



$$\tan \theta \approx \theta \rightarrow \theta = \frac{CE}{r}$$

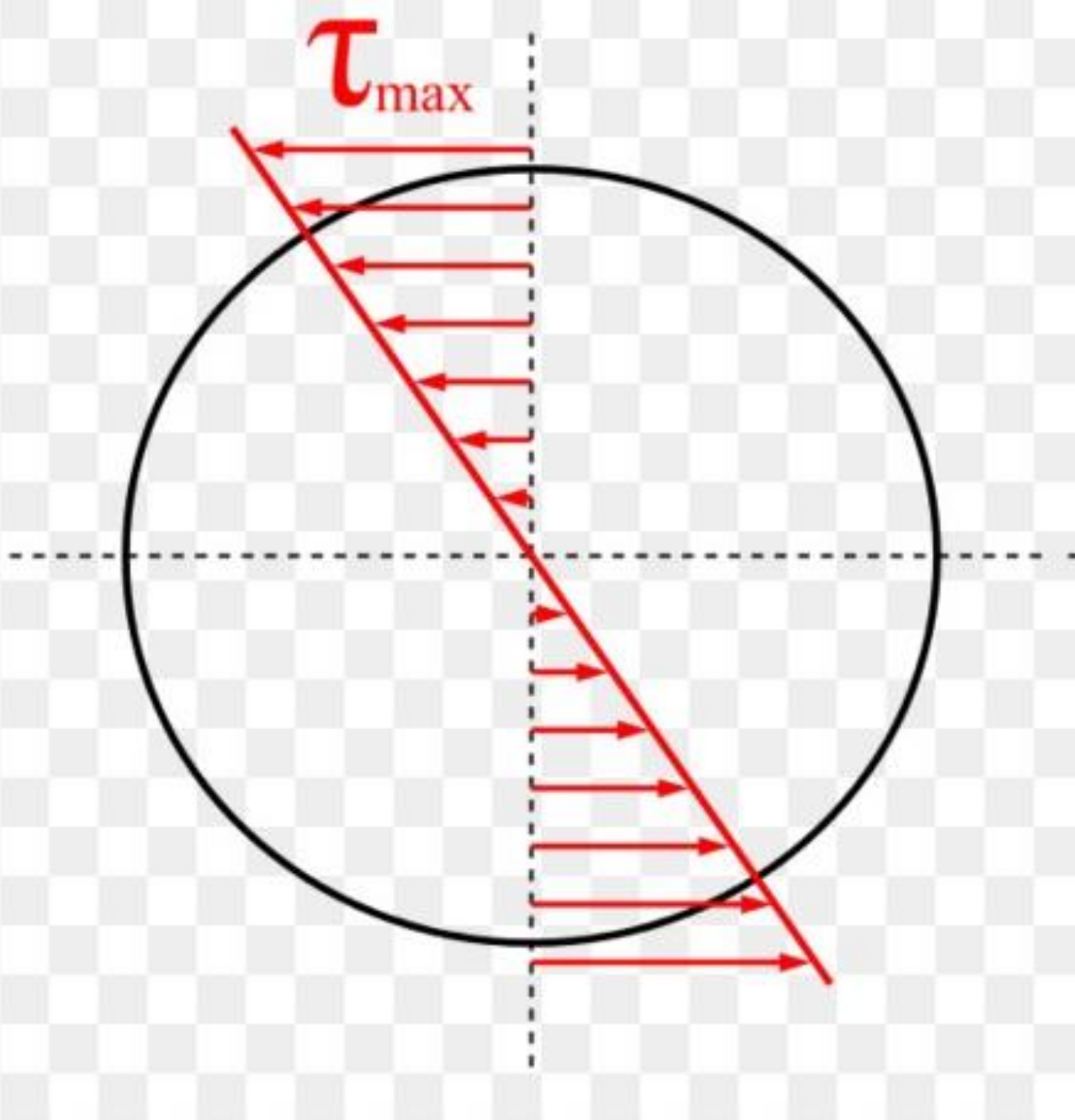
$$\tan \gamma \approx \gamma \rightarrow \gamma = \frac{CE}{L}$$

$$\gamma = \frac{r * \theta_{rad}}{L}$$

$$\boldsymbol{\tau} = \frac{T * r}{J_p}$$

$$\boldsymbol{\gamma} = \frac{r * \theta_{rad}}{L}$$

$$\mathbf{G} = \frac{\boldsymbol{\tau}}{\boldsymbol{\gamma}}$$



$$\tau = \frac{T * r}{J_p}$$

$G \theta^0$	$\theta \dot{\gamma}$	τ	T (N.m)			NO
					2	1
					4	2
					6	3
					8	4
					10	5
					12	6
					14	7
					16	8
					18	9
					20	10
						11

