NOMENCLATURE

x, y, z	Cartesian coordinates in three dimensions
$u(x,y,z)$ $v(x,y,z)$ $w(x,y,z)$	Displacement field components in the x,
y, and z	Cartesian coordinate directions
$\theta' = \beta$	twist rate
$\varphi(y, z)$	unknown function related to deflection and used to define the deflection
$\varepsilon_{xx}, \varepsilon_{yy}, \varepsilon_{zz}$	normal strains
$\gamma_{xy}, \gamma_{xz}, \gamma_{yz}$	shear strains
λ	Lamé's content
G	shear modulus or modulus of rigidity
D_t	torsional rigidity
ε_v	volumetric strain
∂_{ij}	Kronecker's delta
τ_{ij}	stress using indicial notation
ε_{ij}	strain using indicial notation
$\sigma_{xx}, \sigma_{yy}, \sigma_{zz}$	normal stresses
$\tau_{xy}, \tau_{xz}, \tau_{yz}$	shear stresses
$\phi(y, z)$	Prandtl's stress function
R^2	cross-section of the bar
M	torque, torsional moment
Γ	boundary of the cross-section
J	moment of the cross-section, St Venant torsional constant
m, n, m', n'	integers
a,b	in-plane dimensions (length and width)
C_{mn}	unknown parameter of the Prandtl's stress function
a_{mn}	cosine series parameter
r	aspect ratio
$F_1(a/b)$ $F_2(a/b)$	dimensionless torsion parameters
$\bar{F}_1(a/b)$ $\bar{F}_2(a/b)$	dimensionless torsion parameters obtained by Jan Francu et al. [3] using Navier series method
2D	two dimensional
3D	three dimensional
BEM	boundary element method
BVP	boundary value problem
PDE	partial differential equation
FEM	finite element method
FDM	finite difference method

MATHEMATICAL SYMBOLS

$\sum$	summation
$\sum\sum$	double summation
$\int$	integration (integral)
$\iint$	double integration (double integral)
$\frac{\partial}{\partial x}$	partial derivative with respect to x
$\frac{\partial}{\partial y}$	partial derivative with respect to y
$\frac{\partial^2}{\partial x \partial y}$	mixed partial derivative
$\Delta = \nabla^2$	Laplacian