beam with transverse shear and transverse normal effect. Departmental Report No 4, Applied Mechanics Department, Government College of Engineering, Aurangabad, India, pp. 1-96.

NOMENCLATURE

l	length of beam
b	width of beam
t	thickness of beam
x, y, z	three dimensional Cartesian coordinate
3D	three dimensional (three dimensions)
$\varphi(x)$	rotation due to shear deformation
γ_{xz}	transverse shear angle
$\alpha(x)$	rotation due to bending deformation
x	longitudinal coordinate axis of beam
w	transverse deflection
$\varepsilon_{xx}, \varepsilon_{yy}, \varepsilon_{zz}$	normal strains
$\gamma_{xy}, \gamma_{yz}, \gamma_{xz}$	shear strains
$\sigma_{xx}, \sigma_{yy}, \sigma_{zz}$	normal stresses
$\tau_{xy}, \tau_{yz}, \tau_{xz}$	shear stresses
G	shear modulus
E	Young's modulus of elasticity
μ	Poisson's ratio
u, v, w	displacement field components in the x, y, and z coordinate directions respectively
k	shear correction (modification) factor
$M(x)$	bending moment
$Q(x)$	shear force
U	strain energy functional
V	potential of external load
Π	total potential energy functional
$p(x)$	applied load distribution
A	area of cross-section
I	moment of inertia
F	integrand in the total potential energy functional
$\frac{\partial}{\partial w}$	partial derivative with respect to w
$w'(x)$	derivative of $w(x)$ with respect to x
$a_1 \quad a_2$ $c_1 \quad c_2 \quad c_3 \quad c_4$	constants of integration
p_0	intensity of uniformly distributed load
P	point load
$\int$	integral
$\iint$	double integral
$\iiint$	triple integral or volume integral
$\frac{d}{dx}$	ordinary derivative with respect to x

Subscripts

f	flexural
s	shear
b	bending
max	maximum

Superscripts

c	corrected
T	Timoshenko

Abbreviations

EBT	Euler-Bernoulli beam theory
R^3	three dimensional region of integration