In this study, an effective analytical solution for the stability problem of functionally
graded (FG) carbon nanotube reinforced composite (CNTRC) conical shells (CSs)
exposed to external lateral and hydrostatic pressures is presented. The materials of
functionally graded carbon nanotube reinforced composite conical shells (FG-CNTRC-
CSs) are graded in the thickness direction according to linear distributions of the
volume fraction of CNTs. The effective material properties of CNTRC-CSs are
calculated using the extended mixture rule. The basic equations of CNTRC-CSs are
derived using modified Donnell-type shell theory based on the first order shear
deformation theory (FSDT). By using Galerkin method, the expressions for the critical
external pressures of FG-CNTRC-CSs are obtained. The accuracy and reliability of
existing solutions is confirmed by numerical examples and comparison with the results
based on the FSDT and classical shell theory (CST) in the literature. Finally, numerical
calculations are performed to demonstrate the effects of various graded profiles and
volume fraction of CNTs and variation of CSs geometry on the critical external
pressures for FG-CNTRC-CSs.