Assignment 12

Due on 2020-12-06, 23:59 IST.

The due date for submitting this assignment has passed.
As per our records you have not submitted this assignment.

1) Choose True/False for the following assertion: "The order of convergence of the full Newton-Raphson methods is..." 1 point
   - True
   - False
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - True

2) Choose True/False for the following assertion: "The modified Newton-Raphson method takes more steps to solve an equation than the full Newton-Raphson method but has faster convergence..." 1 point
   - True
   - False
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - False

3) Choose True/False for the following assertion: "The line search method should be used when the convergence of the Newton-Raphson method becomes slow or it diverges..." 1 point
   - True
   - False
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - False

4) Choose True/False for the following assertion: "The arc length method cannot be applied to problems where there are no limit points..." 1 point
   - True
   - False
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - True

For Questions 5 - 12 use the following: Consider three nonlinear springs. Springs 1 and 2 are connected in series. They are fixed at one end and the free end is pulled. The first, second and third spring stiffnesses are 1N/m, 3N/m, and 5N/m respectively. The stiffness of spring 1 x k1 = 500 x 50kN/m, stiffness of spring 2 x k2 = 250 x 50kN/m, stiffness of spring 3 x k3 = 100 x 50kN/m. Where u is the elongation of the spring. Assume that a load P = 100 units is applied at the free end of the right end of spring 3. Assume a tolerance of 0.001 units, and initiate guess of u1 = 0 and u2 = 0, where u1 is the elongation in spring 1 and u2 is the displacement of the right end of the spring. Please note that in $\Delta$P appears: our objective is to find the displacement u1 and u2 using full Newton-Raphson method. Write a computer code to solve it.

5) The displacement $u_1$ at the end of 1st iteration is ______ (up to two decimal places only).
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - Type Range: 0.00

6) The displacement $u_2$ at the end of 1st iteration is ______ (up to two decimal places only).
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - Type Range: 0.00

7) The displacement $u_3$ at the end of 2nd iteration is ______ (up to three decimal places only).
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - Type Range: 0.00

8) The displacement $u_2$ at the end of 2nd iteration is ______ (up to three decimal places only).
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - Type Range: 0.00

9) The displacement $u_1$ at the end of 3rd iteration is ______ (up to five decimal places only).
   - No, the answer is incorrect.
   - Score: 0
   - Accepted Answers:
     - Type Range: 0.00

10) The displacement $u_2$ at the end of 3rd iteration is ______ (up to five decimal places only).
    - No, the answer is incorrect.
    - Score: 0
    - Accepted Answers:
      - Type Range: 0.00

11) The displacement at the end of 4th iteration is ______ (up to five decimal places only).
    - No, the answer is incorrect.
    - Score: 0
    - Accepted Answers:
      - Type Range: 0.00

12) The displacement at the end of 4th iteration is ______ (up to five decimal places only).
    - No, the answer is incorrect.
    - Score: 0
    - Accepted Answers:
      - Type Range: 0.00