Assignment 4

Due on 2021-02-17, 23:59 IST.

1) Plot the three functions (a), (b), and (c) for the 3D-rectangular prism element having eight nodes, as shown in Fig. (a).

2) a) $a(x, y, z) = 1 + x + y + z$
   
   b) $b(x, y, z) = x^2 + y^2 + z^2$
   
   c) $c(x, y, z) = x^2 + y^2 - z^2$

3) The selection statement of Fig. (c) for the given data in the table below is as follows (for $x$ = 0.5, $y$ = 0.5, $z$ = 0.5):

   - If $x < 0.5$ then $y = 2x$
   - If $x = 0.5$ then $y = x^2$
   - If $x > 0.5$ then $y = 3x$

4) Which of the following statements are true in the context of natural coordinate system?
   - A) It maps the domain into itself.
   - B) It preserves the shape of the element.
   - C) It is invariant under affine transformations.

5) Which of the following statements are true in the context of natural coordinate system?
   - A) A linear element in the natural coordinate system is a straight line.
   - B) A quadratic element in the natural coordinate system is a parabola.
   - C) A cubic element in the natural coordinate system is a cubic curve.

6) Which of the following statements are true in the context of natural coordinate system?
   - A) A linear element in the natural coordinate system is a straight line.
   - B) A quadratic element in the natural coordinate system is a parabola.
   - C) A cubic element in the natural coordinate system is a cubic curve.

7) Which of the following statements are true in the context of natural coordinate system?
   - A) A linear element in the natural coordinate system is a straight line.
   - B) A quadratic element in the natural coordinate system is a parabola.
   - C) A cubic element in the natural coordinate system is a cubic curve.

8) Which of the following statements are true in the context of natural coordinate system?
   - A) A linear element in the natural coordinate system is a straight line.
   - B) A quadratic element in the natural coordinate system is a parabola.
   - C) A cubic element in the natural coordinate system is a cubic curve.

9) Which of the following statements are true in the context of natural coordinate system?
   - A) A linear element in the natural coordinate system is a straight line.
   - B) A quadratic element in the natural coordinate system is a parabola.
   - C) A cubic element in the natural coordinate system is a cubic curve.

10) Which of the following statements are true in the context of natural coordinate system?
    - A) A linear element in the natural coordinate system is a straight line.
    - B) A quadratic element in the natural coordinate system is a parabola.
    - C) A cubic element in the natural coordinate system is a cubic curve.