

e)

$$f(x, y, z) = x^3 y z^2 + 2x^2 y^2 z + 5z^3$$

$$f_x = 3x^2 y z^2 + 4x y^2 z + 0$$

$$f_y = x^3 z^2 + 4x^2 y z$$

$$f_z = 2x^3 y z + 2x^2 y^2 + 15z^2$$

$$f_{xx} = 6x y z^2 + 4y^2 z$$

$$f_{yy} = \cancel{3x^2 z^2} + 4x^2 z$$

$$f_{zz} = 2x^3 y + 30z$$

$$f_{xxx} = 6y z^2$$

$$f_{yyy} = 0$$

$$f_{zzz} = 30$$