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Course Code: MAT101 | Course Title: Mathematics-I | Semester: Summer-2026

Date: 13.06.2026 | Time: 35 minutes | Section: 72_C

Answer all the questions

Mark

1) Find whether the following statements are True or False (with justification):

a. Every differentiable function is continuous.

b. If a function is one-to-one and onto, then its inverse exists.

c. If a polynomial has real coefficients and "*i*" is a root, then "*-i*" must also be a root. 5

d. Every continuous function is differentiable.

e. According to Descartes' Rule of Signs, the number of positive real roots of a polynomial is always exactly equal to the number of sign changes in f(x).

2) Consider,

$$f(x) = \begin{cases} 3x^2 + 2x - 1, & x < 1, \\ 4, & x = 1, \\ x + 3, & x > 1. \end{cases}$$ 5

Determine whether f(x) is differentiable at x=1.

3) Let,

$$2x^5 - 11x^4 + 16x^3 - x^2 - 6x = 0$$ 5