The Open University of Sri Lanka

B.Sc/B.Ed. Degree Programme – Level 04

No Book Test (NBT) – 2023/2024

Pure Mathematics

PEU4315 – Continuous Functions

Duration: - One Hour.

Date: - 19.08.2023 **Time: - 04.00 p.m. – 05.00 p.m.**

Answer All Questions

1. (a). Let $f(x) = \begin{cases} x & \text{if } x < 1 \\ 3 - x & \text{if } x \geq 1 \end{cases}$.

(i). Find the value of $\lim_{x \to 1-} f(x)$.

(ii). Find the value of $\lim_{x \to 1+} f(x)$.

(iii). Does the $\lim_{x \to 1} f(x)$ exist?

(b). Let $h(x) = x^3 + x$ defined on the interval $(0, 2)$. Prove that $\lim_{x \to 1} h(x) = 2$.

[50 Marks]

2. (a). State the definition of a continuous function on an open interval.

(b). Define $h: (-1,\ 5) \to \mathbb{R}$ by $h(x) = \sqrt{5 + 4x - x^2}$ for each $x \in (-1, 5)$.

Show that h is continuous on $(-1, 5)$.

[50 Marks]

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