The Open University of Sri Lanka

B.Sc/B.Ed Degree programme

Pure Mathematics – Level 04

PEU4301- Real Analysis II

Open Book Test (OBT)- 2023/2024

Date: 22.12.2023	Time: 04.00 p.m. – 05.00 p.m.

Answer All Questions

1. Determine whether each of the following sets has limit points and justify your answer. If they exist, find the set of limit points.

    a. $(0,1) \cup (1,2) \cup (2,3) \cup ... \cup (n, n+1)$

    b. Set of positive integers $\mathbb{Z}^+$

    c. $(-1,1]$

2. (a) Consider the function $f \colon [0, \infty) \to [0, \infty)$ given by $f(x) = \sqrt{x}$ for each $x \in [0, \infty)$. Show that $\lim\limits_{x \to 4} f(x) = 2$.

    (b) Let $g \colon [0, \infty) \to [0, \infty)$ be $g(x) = 2\sqrt{x}, x \in [0, \infty)$. Find $\lim\limits_{x \to 4} g(x)$.

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