The Open University of Sri Lanka
B.Sc/B.Ed. Degree Programme
Open Book Test (OBT) - 2017/2018
Pure Mathematics - Level 04
PUU2141/PEU4315 Continuous Functions

Duration: One Hour

Date: 01.06.2018 Time: 04.15pm - 05.15pm

Answer ALL Questions.

1. (a) State whether the following statements A-B are **correct** or **incorrect**. Justify your answer.

   A. If $E = \{2016, 2017, 2018\}$ then 2016, 2017, 2018 are isolated points of E.

   B. If f be a function not defined at 4 then $\lim_{x\to 4} f(x)$ does not exist.

   (b) Let $A = \{\frac{n}{3n+1} : n \in \mathbb{N}\}$. Show that $\frac{1}{3}$ is a limit point of A.

2. (a) Let $f(x) = x^3$, $x \in \mathbb{R}$. Using the definition, prove that $\lim_{x\to 3} f(x) \neq 6$.
   (b) Let $f(x) = x^3 + 3x^2 + 6$, $x \in \mathbb{R}$. Using the definition, show that $\lim_{x\to 2} f(x) = 26$.

   (c) Let $f(x) = \begin{cases} 2018, & \text{if } x \in (1, 3]; \\ 0, & \text{if } x = 1. \end{cases}$
   Prove that $\lim_{x\to 1^+} f(x) = 2018$.

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