Indian Institute of Technology Jodhpur
MAL1010, Quiz-2, 03 Jan'22

Time: 45Min Marks: 15

Name: ..... Roll No: .....

Q.1. Test the convergence or divergence of the series

$$\sum_{n=3}^{\infty} (-1)^{n+1} \frac{\ln n}{n}$$

[4]

Q.2. Examine the convergence or divergence of the following series. Justify your answer.

$$\sum_{n=2}^{\infty} (-1)^{n} \frac{2 + (-1)^{n}}{\ln n}$$

[4]

Q.3. Prove that $\lim_{x \to 2} f(x) = 4$ by using $\epsilon - \delta$ definition, where

$$f(x) := \begin{cases} x^2, & x \neq 2 \\ 1, & x = 2 \end{cases}$$

[4]

Q.4. Use intermediate value property to prove the following statement.
If f is continuous on the interval $[0, 2]$ with $f(0) > 0$ and $f(2) < 4$, then there is some real number c in the interval $(0, 2)$, which satisfies that $f(c) = c^2$.

[3]