

First Unit test, 2021

H.S Second year
Mathematics

Full Marks. 20

Time 1 hours

$$1 \times 5 = 5$$

1. Answer the following questions:

(a) Is the function $f(x) = x^2$, $x \in R$, increasing?

(b) Is the derivative of an even function even?

(c) If $f(x) = 2x-1$, Find $f\{f(x)\}$.

(d) Define left hand limit of a function.

(e) Write the value of $\lim_{x \rightarrow 0} \frac{\sin x}{x}$

2 Evaluate the following limit

(i) $\lim_{x \rightarrow 3} \frac{x^2-9}{x-3}$ 2

(ii) $\lim_{x \rightarrow 1} \frac{x^2-4x+3}{x-1}$ 3

(iii) $\lim_{x \rightarrow 0} \left\{ \frac{\sqrt{1+x} - \sqrt{1-x}}{x} \right\}$ 4

(iv) $\lim_{x \rightarrow 0} \frac{\sin ax}{\sin bx}$ 4

3 Give the mathematical definition of continuity of a function at a point. 2