Preparation for CSIR NET | IIT JAM | GATEContinuity and Differentiability: Short Trick

$$f(x) = \begin{cases} x^{x} \sin(\frac{1}{x^{p}}) : x \neq 0 \\ 0 & x = 0 \end{cases}$$
(i) $f(x)$ is differenciable at $x = 0$ iff $x > 1$
(ii) $f(x)$ is Continous at $x = 0$ iff $x > 0$

$$f(x) = \int x^2 \sin(\frac{1}{x}) \qquad x \neq 0$$

$$0 \qquad x = 0$$
(a) limit does not exist.

(b) Continous and differenciable

(C) Continous but not differenciable.

(d) None of these.

$$f(x) = \begin{cases} \int x \sin(\frac{1}{x}) & x \neq 0 \\ 0 & x = 0 \end{cases}$$
 then $f(x)$ is at $x = 0$.

Limit does not exist.

Limit does not exist.

Continous and differenciable (b)

Continous but not differenciable.

None of these. (d)

(a)

 $f(x) = \begin{cases} x^2 \sin(\frac{1}{x}) & x \neq 0 \\ 0 & x = 0 \end{cases}$ then f(x) is at x = 0(a) limit does not exist. Continous and differenciable Continous but not differenciable. None of these.

 $f(x) = \begin{cases} x^{1/3} \sin(\frac{1}{x}) & x \neq 0 \\ 0 & x = 0 \end{cases}$ then f(x) at x = 0i.

(a) Limit does not exist

(b)

Continous and differenciable Continous but not differenciable. ces

None of these. (d)