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## MATHS

## BOOKS - JEE MAINS PREVIOUS YEAR

## CONTINUITY AND DIFFERENTIABILITY

## Others

1. 

Let
$f(x)=\left\{(x-1) \frac{\sin 1}{x-1} \quad\right.$ if $\quad x \neq 10, \quad$ if $\quad x=1$
. Then which one of the following is true? $f$ is
differentiable at $x=0$ and at $x-1 \quad f$ is differentiable at $x=0$ but not at $x=1 f$ is differentiable at $x=0$ nor at $x=1 f$ is differentiable at $x=1$ but not at $x=0$

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2. Let $y$ be an implicit function of $x$ defined by $x^{2 x}-2 x^{x} \cot y-1=0$. Then y (1) equals
3. The value of $p$ and $q$ for which the function
$f(x)=\left[\begin{array}{cc}\frac{\sin (p+1) x+\sin x}{x} & x<0 \\ q & x=0 \\ \frac{\sqrt{x+x^{2}}-\sqrt{x}}{x^{3 / 2}} & x>0\end{array}\right]$
continuous for all $x$ in $R$, are : (1)
$p=\frac{1}{2}, q=-\frac{3}{2}$
(2) $p=\frac{5}{2}, q=-\frac{1}{2}$
(3) $p=-\frac{3}{2}, q=\frac{1}{2}$
(4) $p=\frac{1}{2}, q=\frac{3}{2}$
4. Let $\mathrm{a}, \mathrm{b} \mathrm{R}$ be such that the function f given by $f(x)=\ln |x|+b x^{2}+a x, x \neq 0$ has extreme values at $x=1$ and $x=2$. Statement 1: f has
local maximum at $x=1$ and at $x=2$
Statement 2: $a=\frac{1}{2} \operatorname{and} b=\frac{-1}{4}$ (1) Statement
1 is false, statement 2 is true (2) Statement 1 is
true, statement 2 is true; statement 2 is a correct explanation for statement 1

Statement 1 is true, statement 2 is true;
statement 2 is not a correct explanation for
statement 1 (4) Statement 1 is true, statement 2 is false

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5. 

Consider
the
function
$f(x)=|x-2|+|x-5|, x \in R$. Statement 1:
$f^{\prime}(4)=0$ Statement 2: $f$ is continuous in $[2,5]$,
differentiable in $(2,5)$ and $f(2)=f(5)$.
(1)

Statement 1 is false, statement 2 is true (2)

Statement 1 is true, statement 2 is true;
statement 2 is a correct explanation for
statement 1 (3) Statement 1 is true, statement 2
is true; statement 2 is not a correct explanation
for statement 1 (4) Statement 1 is true, statement 2 is false

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6. For $x \in R, f(x)=|\log 2-\sin x| \quad$ and
$g(x)=f(f(x))$, then
(1) $g$ is not differentiable at $x=0$
(2) $g^{\prime}(0)=\cos (\log 2)$
(3) $g^{\prime}(0)=-\cos (\log 2)$
(4) $g$ is differentiable at $x=0$ and $g^{\prime}(0)=-\sin (\log 2)$

