#ASSIGNMENT: CONTINUITY

Q.1 Find value of a for which the defined function is continuous at x=0.

$$F(x)=\begin{cases} a\,\mathrm{Sin}\frac{\pi}{2}(x+1) ; x \le 0 \\ \frac{tanx-Sinx}{x^3} ; x > 0 \end{cases}$$

Ans.) a=1/2

Q.2 Find value of a and b for which the defined function is continuous at x=0.

$$F(x)=\begin{cases} \frac{Sin(a+1)x+2Sinx}{x} ; x < 0 \\ 2 ; x = 0 \\ \frac{\sqrt{1+bx}\ -1}{x} ; x > 0 \end{cases}$$

Ans.) a=-1, b=4

Q.3 Find values of K for which the defined function is continuous at x=0.

$$F(x)=\begin{cases} \frac{1-Cos4x}{8x^2} ; x \neq 0 \\ K ; x = 0 \end{cases}$$

Ans.) K=1

Q.4 Find value of p and q for which the function is continuous at x=$\frac{\pi}{2}$.

$$F(x)=\begin{cases} \frac{1-Sin^3x}{3Cos^2x} ; x < \frac{\pi}{2} \\ p ; x = \frac{\pi}{2} \\ \frac{q(1-Sinx)}{(\pi-2x)^2} ; x > \frac{\pi}{2} \end{cases}$$

Ans.) p=1/2, q=4

Q.5 Find value of K for which the function is continuous at x=$\frac{\pi}{2}$.

$$F(x)=\begin{cases} \frac{KCosx}{\pi-2x} ; x \neq \frac{\pi}{2} \\ 3 ; x = \frac{\pi}{2} \end{cases}$$

Ans.) K=6

Q.6 Find value of a for which the defined function is continuous at x=0.

$$F(x)=\begin{cases} \frac{1-Cos4x}{x^2} ; x < 0 \\ a ; x = 0 \\ \frac{\sqrt{x}}{\sqrt{16+\sqrt{x}}-4} ; x > 0 \end{cases}$$

Ans.) a=8

Q.7 Find value of K for which the function is continuous at x=0.

$$F(x)=\begin{cases} \frac{\sqrt{1+Kx}-\sqrt{1-Kx}}{x} ; -1 \le x < 0 \\ \frac{2x+1}{x-1} ; 0 \le x < 1 \end{cases}$$

Ans.) K=-1

Q.8 Find value of K for which the function is continuous at x=0.

F(x)= $\begin{cases} \frac{e^x+e^{-x}-2}{x^2} ; x \neq 0 \\ 4K \quad\quad ; x = 0 \end{cases}$ Ans.) K=1/4

Q.9 Find value of c, a & b for which the function is continuous at x=0.

F(x)= $\begin{cases} \frac{Sin(a+1)x+Sinx}{x} ; x < 0 \\ c \quad\quad\quad ; x = 0 \\ \frac{\sqrt{x+bx^2}-\sqrt{x}}{b\sqrt{x^3}} ; x > 0 \end{cases}$ Ans.) a=-3/2, c=1/2, b∈R≠ $\{0\}$

Q.10 Discuss the continuity of function at x=0

(a) F(x)= $\begin{cases} \frac{Sinx}{x} + Cosx ; x \geq 0 \\ \frac{4(1-\sqrt{1-x})}{x} ; x < 0 \end{cases}$ (b) F(x) = $\begin{cases} \frac{\log(1+3x)}{x} ; x \neq 0 \\ 3 \quad\quad ; x = 0 \end{cases}$

Q.11 Find value of k for which the function is continuous at x=2.

F(x) = $\begin{cases} \frac{2^{x+2}-16}{4^x-16} ; x \neq 2 \\ K \quad\quad ; x = 2 \end{cases}$ Ans.) K=1/2

Q.12 Find value of b and a such that the function is continuous at x=4.

F(x)= $\begin{cases} \frac{x-4}{|x-4|} + a ; x < 4 \\ a + b \quad\quad ; x = 4 \\ \frac{x-4}{|x-4|} + b ; x > 4 \end{cases}$ Ans.) a=1, b=-1

Q.13 Find value of K for which the function is continuous at x=0.

F(x)= $\begin{cases} \frac{\log(1+2x)-\log(1-3x)}{x} ; x \neq 0 \\ K \quad\quad\quad ; x = 0 \end{cases}$ Ans.) K=5

Q.14 Find value of K for which the function is continuous at x=0 if

F(x) = $\begin{cases} \frac{Cos3x-Cosx}{x^2} ; x \neq 0 \\ K \quad\quad ; x = 0 \end{cases}$ Ans.) K=-4

Q.15 Show that the function defined is discontinuous at x=0, whose LHL =-1 and RHL=1

F(x)= $\begin{cases} \frac{e^{1/x}-1}{e^{1/x}+1} ; x \neq 0 \\ 0 \quad\quad ; x = 0 \end{cases}$