**ATOMIC ENERGY EDUCATION SOCIETY, MUMBAI**

**CLASS: XII (MATHS)** **WORKSHEET: MODULE 1/4**
**CHAPTER-5** **TOPIC: CONTINUITY AND DIFFERENTIABILITY**

Q1. Find the value of k, for which $f(x) = \begin{cases} \frac{\sqrt{1+kx}-\sqrt{1-kx}}{x} & ,if\ -1 \le x < 0 \\ \frac{2x+1}{x-1} & ,\quad if\ 0 \le x < 1 \end{cases}$ is continuous at

x = 0

Q2.Find the value of k , so that the function f defined by f(x) = $\begin{cases} \frac{k\ cosx}{\pi-2x} & ,if\ x \neq \frac{\pi}{2} \\ 3 & ,if\ x = \frac{\pi}{2} \end{cases}$ is continuous at

x = $\frac{\pi}{2}$

Q3. Find the values of a and b such that the following function f(x) is a continuous function

$$f(x) = \begin{cases} 5 & x \le 2 \\ ax + b\ , & 2 < x < 10 \\ 21\ , & x \ge 10 \end{cases}$$

Q4. Find the value of a , if the function f(x) defined by f(x) = $\begin{cases} 2x - 1\ , & x < 2 \\ a\ , & x = 2 \\ x + 1\ , & x > 2 \end{cases}$ is continuous at

x = 2

Q5.If f(x) defined by the following , is continuous at x = 0 , then find the values of a ,b and c

$$\text{f(x)} = \begin{cases} \frac{\sin(a+1)x+sinx}{x} & ,if\ x < 0 \\ c & if\ x = 0 \\ \frac{\sqrt{x+bx^2}-\sqrt{x}}{b(x)^{3/2}} & ,\ if\ x > 0 \end{cases}$$

Q6. Show that f(x) = $\begin{cases} 5x - 4 & ,when\ 0 < x \le 1 \\ 4x^3 - 3x\ , & when\ 1 < x < 2 \end{cases}$ is continulus at x = 1

Q 7. Discuss the continuity of the function $f(x) = \begin{cases} x^3 - 3, & x \le 2 \\ x^2 + 1, & x > 1 \end{cases}$

Q8. Find the relation between a and b so that $f(x) = \begin{cases} ax + 1, & x \le 3 \\ bx + 3, & x > 3 \end{cases}$ is continues at x = 3.

Q9. Show that the function defined by $g(x) = x - [x]$ is discontinuous at all integral points.

Q10. Discuss the continuity of the function (i) $f(x) = \frac{1}{x}$ (ii) $f(x) = \frac{1}{|x-5|}$ (iii) $f(x) = |x-5|$

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