DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth   **SUBJECT : MATHS**

DATE :   **DPP NO. :1**

Topic :- LIMITS AND DERIVATIVES

1. $\lim\limits_{\theta \to \frac{\pi}{2}} \dfrac{\frac{\pi}{2}-\theta}{\cot\theta}$ is equal to

   a) 0   b) -1   c) 1   d) ∞

2. $\lim\limits_{x \to 0} \dfrac{a^x - b^x}{e^x - 1}$ is equal to

   a) $\log_e\left(\dfrac{a}{b}\right)$ b) $\log_e\left(\dfrac{b}{a}\right)$ c) $\log_e(ab)$ d) $\log_e(a+b)$

3. $\lim\limits_{x \to -\infty} \dfrac{2x-1}{\sqrt{x^2+2x+1}}$ is equal to

   a) 2   b) -2   c) 1   d) -1

4. $\lim\limits_{x \to 2} = \dfrac{\sqrt{1+\sqrt{2+x}}-\sqrt{3}}{x-2}$ is equal to

   a) $\dfrac{1}{8\sqrt{3}}$ b) $\dfrac{1}{\sqrt{3}}$ c) $8\sqrt{3}$ d) $\sqrt{3}$

5. $\lim\limits_{x \to 0} \left\{\dfrac{1}{x\sqrt[3]{8+x}} - \dfrac{1}{2x}\right\}$ is equal to

   a) $\dfrac{1}{12}$ b) $\dfrac{-4}{3}$ c) $\dfrac{-16}{3}$ d) $\dfrac{-1}{48}$

6. The value of $\lim\limits_{x \to 0} \dfrac{a^x - b^x}{x}$, is

   a) $\log\left(\dfrac{a}{b}\right)$ b) $\log\left(\dfrac{b}{a}\right)$ c) $\log(ab)$ d) $-\log(ab)$

7. $\lim\limits_{x \to 1} \dfrac{\sum_{r=1}^{n} x^r - n}{x-1}$ is equal to

   a) $\dfrac{n}{x}$ b) $\dfrac{n(n+1)}{2}$ c) 1   d) 0

8. The value of $\lim\limits_{x \to 1}(\log_5 5x)^{\log_x 5}$ is

   a) 1   b) e c) -1 d) None of these

9. $\lim\limits_{x \to 0} \dfrac{e^{\tan x}-e^x}{\tan x - x} =$

   a) 1   b) e c) $e-1$ d) 0

10. The value of $\lim\limits_{x \to \infty}\left(\dfrac{x^2-2x+1}{x^2-4x+2}\right)^x$, is

    a) e^2 b) e^{-2} c) e^6 d) None of these

11. If $\lim\limits_{x \to 0} \dfrac{\log(x+a)-\log a}{x} + k\lim\limits_{x \to e}\dfrac{\log x - 1}{x-e} = 1$, then the value of k is

    a) $1 - \dfrac{1}{a}$ b) $e(1-a)$ c) $e\left(1-\dfrac{1}{a}\right)$ d) $e(1+a)$

12. The value of $\lim\limits_{x \to \infty} \frac{\sin x}{x}$, is
   a) 1   b) 0   c) -1 d) None of these

13. $\lim\limits_{x \to 0} x \log \sin x$ is equal to
   a) 0   b) ∞
   c) 1   d) Cannot be determined

14. $\lim\limits_{x \to 0} \frac{d}{dx} \int \frac{1-\cos x}{x^2} \, dx$ is equal to
   a) 1   b) 0   c) 1/2   d) None of these

15. $\lim\limits_{x \to 0} \frac{1}{x} \left\{ \int_y^a e^{\sin^2 t} dt - \int_{x+y}^a e^{\sin^2 t} \, dt \right\}$ is equal to (where a is a constant)
   a) $e^{\sin^2 y}$ b) $\sin 2y \, e^{\sin^2 y}$ c) 0   d) None of these

16. Let $f''(x)$ be continuous at $x = 0$ and $f''(0) = 4$. Then $\lim\limits_{x \to 0} \frac{2f(x)-3f(2x)+f(4x)}{x^2}$ is equal to
   a) 11   b) 2   c) 12   d) None of these

17. If $\lim\limits_{x \to 0} \frac{[(a-n)nx-\tan x]\sin nx}{x^2} = 0$, where n is non-zero real number, then a is equal to
   a) 0   b) $\frac{n+1}{n}$ c) n d) $n + \frac{1}{n}$

18. The values of a and b such that $\lim\limits_{x \to 0} \frac{x(1+a\cos x)-b\sin x}{x^3} = 0$, are
   a) $\frac{5}{2}, \frac{3}{2}$ b) $\frac{5}{2}, -\frac{3}{2}$ c) $-\frac{5}{2}, -\frac{3}{2}$ d) None of these

19. The value of $\lim\limits_{x \to \infty} \left(\frac{x^2-2x+1}{x^2-4x+2} \right)^x$ is
   a) e^2 b) e^{-2} c) e^6 d) None of these

20. The value of $\lim\limits_{x \to 0} \frac{(1-\cos 2x)}{x^2}$ is
   a) Does not exist   b) Infinite   c) 0   d) 2