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Practice Set 4 Solution

# Function & LIMIT

Topics:

- 1. Function and simple examples
- 2. Limit of a Function
- 3. Standard formulae of Limit and related simple examples

DDCET final exam weightage of this topic:

3 Questions (6 Marks)

Total Practice sets of this topic:

5 (sets)  $\times$  30 (questions) = 150 Questions

Total Practice tests of this topic:

2 ( exams )  $\times$  30 ( questions ) = 60 Questions

Offline / Online during lecture :

4 (lectures) X 50 (Questions) = 200 Question



- 1. Function and simple examples
- 2. Limit of a Function
- 3. Standard formulae of Limit and related simple examples

1. 
$$\lim_{x\to 0} \left(\frac{\sin x}{x}\right) =$$

- a. 1 🗸
- b. 0
- $c. \infty$
- d. does not exist

2. 
$$\lim_{x\to\infty} (1/x) =$$

- $a. \infty$
- b. 1
- c. 0 ✓
- $d. -\infty$

$$3. \lim_{x\to 0} \left(\frac{1-\cos x}{x^2}\right) =$$

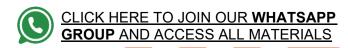
- a. 0
- b. 1
- c. 1/2 **✓**
- $d. \infty$

4. 
$$\lim_{x \to a} \left( \frac{x^2 - a^2}{x - a} \right) =$$

- a. 2a **✓**
- b. a
- c. a<sup>2</sup>
- d. 0

$$5. \lim_{x \to 0} \left( \frac{\tan x}{x} \right) =$$

- a. 0
- b. 1 **✓**
- $c. \infty$
- d. does not exist





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6. 
$$\lim_{x\to 0} \left(\frac{e^{x}-1}{x}\right) =$$

- a. 0
- b. 1 **✓**
- c. e
- $d. \infty$

$$7. \lim_{x \to \infty} \left( \frac{x^2 + 1}{x} \right) =$$

- a. ∞ **√**
- b. 1
- c. 0
- d. does not exist

8. 
$$\lim_{x \to 2} \left( \frac{x^2 - 4}{x - 2} \right) =$$

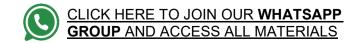
- a. 2
- b. 3
- c. 4 **√**
- d. 6

9. 
$$\lim_{x \to 0} \frac{x}{|x|} =$$

- a. 1
- b. -1
- c. does not exist ✓
- d. 0

$$10.\lim_{x\to\infty}\left(\frac{3x^2+5}{x^2+2}\right) =$$

- a. 1
- b. 3 **✓**
- $c. \infty$
- d. 0







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$$11.\lim_{x\to 0}\frac{\sin 2x}{x} =$$

- a. 2 **✓**
- b. 1
- c. 1/2
- d. 0

$$12.\lim_{x\to 0}\frac{\cos 4x}{x} =$$

- a. 2
- b. 3
- c. 4
- d. does not exist ✓

$$13.\lim_{x\to 0} \frac{2^{x}-1}{x} =$$

- a. ln2 **✓**
- b. log<sub>2</sub>e
- c. 1
- d. 0

$$14.\lim_{x\to 0} \frac{7^{x}-1}{x} =$$

- a.  $log_{10}7$
- b. log<sub>e</sub>7 ✓
- c. 1
- d. 0





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$$15.\lim_{n\to\infty}\left(1+\frac{1}{n}\right)^n=$$

- a. 0
- b. 1
- c. e **√**
- $d. \infty$

$$16.\lim_{x\to 2}\frac{x^{5}-32}{x-2}=$$

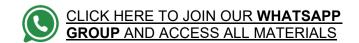
- a. 80 **✓**
- b. 160
- c. 40
- d. 0

$$17.\lim_{x\to 0}\frac{a^{x}-1}{x} \text{ where } a>0=$$

- a. 1
- b. log<sub>e</sub> a **√**
- c. a
- d. 0

$$18. \lim_{x \to 0+} \ln(x) =$$

- a. 0
- **b**. ∞
- c. -∞ **√**
- d. undefined





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$$19.\lim_{x\to 0+}\left(\frac{x+1}{x}\right) =$$

- a. 1
- b. 0
- c. ∞ **√**
- d. 2

$$20.\lim_{x\to 0^+} \left(\frac{1}{x}\right) =$$

- a. 0
- b. ∞ **√**
- c. -∞
- d. does not exist

$$21.\lim_{x\to\infty}\left(\frac{x+2}{3x+1}\right) =$$

- a. 1
- b. 2
- c. 3
- d. 1/3 ✓

$$22.\lim_{x\to\infty} \left( \frac{2x^2 + 5x - 6}{4x^2 + 4x - 3} \right) =$$

- a. 1
- b. 1/2 **✓**
- c. 2/5
- d. 0







1. Function and simple examples

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$$23.\lim_{x\to 0} (x \cdot \tan x) =$$

b. 1

c. ∞

d. does not exist

24. 
$$\lim_{x \to 0} \left( \frac{10^x - 5^x}{x} \right) =$$
\_\_\_\_\_. [DDCET-2024]

a. 
$$log_e\left(\frac{1}{2}\right)$$

b. 
$$log_e(10)$$

c. 
$$log_e(5)$$

d. 
$$log_e(2)$$
  $\checkmark$ 

25. 
$$\lim_{n \to \infty} \left( \frac{3n^2 - 11n - 13}{(4n - 5)(7 - 6n)} \right) =$$
\_\_\_\_\_. [DDCET-2024]

a. 
$$\frac{1}{4}$$

b. 
$$-\frac{1}{8}$$

c. 
$$\frac{1}{6}$$

d. 
$$-\frac{1}{4}$$

$$26.\lim_{x\to 0} (\sec^2 x - \tan^2 x) =$$

d. 
$$\frac{\pi}{2}$$





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27. 
$$\lim_{n\to\infty} \left(\frac{4n^2+5n-1}{2n^2+3n+7}\right) = \underline{\hspace{1cm}}$$

$$d. \infty$$

$$28.\lim_{x\to 0} \left(\frac{e^{3x}-e^{2x}}{x}\right) = \underline{\hspace{1cm}}$$

b. 
$$e^3 - e^2$$

$$29.\lim_{x\to 0}\frac{\sin x^0}{x}=$$

c. 
$$\frac{\Pi}{180}$$
  $\checkmark$ 

d. 
$$\frac{180}{\pi}$$

$$30.\lim_{x\to 0} \frac{\sin^2 x + x^2 \cdot \cos^2 x}{x^2} =$$

