



BK BIRLA CENTRE FOR EDUCATION
SARALA BIRLA GROUP OF SCHOOLS
SENIOR SECONDARY CO-ED DAY CUM BOYS' RESIDENTIAL SCHOOL



PERIODIC TEST-2 2024-25

APPLIED MATHEMATICS (241)

CLASS: XI COMM
TIME: 1 HR

MAX. MARKS: 25
DATE: 06/12/24

General Instructions:

1. This Question Paper has 3 Sections A, B and C.
2. Section A has 10 MCQs carrying 1 mark each
3. Section B has 3 questions carrying 02 marks each.
4. Section C has 3 questions carrying 03 marks each.
5. All Questions are compulsory.

SECTION A

1. The value of $\lim_{x \rightarrow 0} [x]$
(a) -1 (b) 0 (c) 1 (d) none of these 1
2. $\lim_{x \rightarrow 1} \frac{x^m - 1}{x^n - 1}$ is equal to
(a) 1 (b) m/n (c) -m/n (d) m^2/n^2 1
3. $\lim_{x \rightarrow \infty} \frac{1+2+3+\dots+n}{n^2}$, (n is a natural number) is equal to
(a) 0 (b) 1 (c) 1/2 (d) none of these 1
4. The function $f(x) = \begin{cases} 1 & \text{if } x \neq 0 \\ 2 & \text{if } x = 0 \end{cases}$ is not continuous at
(a) $x = 0$ (b) $x = 1$ (c) $x = 2$ (d) none of these 1
5. If $f(x) = x^2 + 5x + 2$, then $f'(3)$ is
(a) 12 (b) 10 (c) 11 (d) none of these 1
6. The derivative of $\log(e^{x^2})$ is
(a) e^{x^3} (b) $2x$ (c) 2 (d) none of these 1
7. If $f(x) = \frac{x-4}{2\sqrt{x}}$, then $f'(1)$ is
(a) 5/4 (b) 4/5 (c) 1 (d) none of these 1
8. If $y = \sqrt{x} + \frac{1}{\sqrt{x}}$ then derivative of y w.r.t x at $x=1$ is
(a) 1 (b) $\frac{1}{2}$ (c) 0 (d) none of these 1
9. Assertion: The derivative of x^3 is $3x$.
Reason: If $f(x)$ is x^n then $f'(x) = nx^{n-1}$. 1

- (a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).
- (b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).
- (c) Assertion (A) is true but reason (R) is false.
- (d) Assertion (A) is false but reason (R) is true.

10. Assertion: $f(x) = |x|$ is continuous at $x = 0$.
Reason: The left hand limit and right hand limit of $f(x)$ at $x = 0$ are equal
- (a) Both assertion (A) and reason (R) are true and reason(R) is the correct explanation of assertion (A).
 - (b) Both assertion (A) and reason (R) are true but reason(R) is not the correct explanation of assertion (A).
 - (c) Assertion (A) is true but reason (R) is false.
 - (d) Assertion (A) is false but reason (R) is true.

SECTION B

11. For what value of k is the function $f(x) = \begin{cases} kx^2, & x \geq 1 \\ 4, & x < 1 \end{cases}$ is continuous at $x = 1$. 2
12. Find the derivatives of function $f(x) = (2x+3)\sqrt{x}$ w.r.t x. 2
13. If $f(x) = 2x^2 + 3x - 5$. Prove that $f'(0) + 3f'(-1) = 0$ 2

SECTION C

14. Evaluate the following limit, if it exists 3
 $\lim_{x \rightarrow 4} \sqrt{8 - 2x}$
15. If $\lim_{x \rightarrow 1} \frac{x^4 - 1}{x^1 - 1} = \lim_{x \rightarrow k} \frac{x^3 - k^3}{x^2 - k^2}$, find the value of k. 3
16. Find the derivative of $f(x) = 1/x^2$ by first principle. 3

BEST OF LUCK