Code:D

Subject: Mathematics 1 (MCI101), **Quiz 1, Full Marks:** 10, Date: 05.12.2022, Time: 7.00 PM to 7.30 PM

Admission Number: Signature: Section:

1. The radius of curvature of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ at the point (a,0) is

(a) $\frac{b^2}{a}$ (b) $\frac{a^2}{b}$ (c) $\frac{a}{b^2}$ (d) $\frac{b}{a^2}$

2. If the value of the integral $\int_0^1 \frac{x^2}{\sqrt{1-x^5}}\,dx$ is $K_1\,\beta\left(K_2,\frac{1}{2}\right)$ then $\frac{K_2}{K_1}$ is equal to

(a) 1 (b) 2 (c) 3 (d) 4

3. The integral $\int_1^\infty \sin\left(\frac{1}{x}\right)dx$ is

(a) Divergent (b) Converges to 1 (c) Converges to 0 (d) None of these

4. Find an asymptote for the following curve: $x=\frac{t}{1+t^3}, y=\frac{t^2}{1+t^3}$

(a) $y-x+\frac{1}{3}=0$ (b) $y-x-\frac{1}{3}=0$ (c) $y+x-\frac{1}{3}=0$ (d) $y+x+\frac{1}{3}=0$

5. The expansion of $f(x)=ln(1+e^x)$ at x = 0?

(a) $ln2+\frac{x}{2}+\frac{x^2}{8}-\frac{x^4}{192}+\cdots$ (b) $ln2+\frac{x}{2}+\frac{x^2}{8}-\frac{x^4}{192}+\cdots$ (c) $ln2+\frac{x}{2}+\frac{x^3}{8}-\frac{x^5}{192}+\cdots$

(d) $ln2+\frac{x}{2}+\frac{x^3}{8}-\frac{x^5}{192}+\cdots$

6. The value of $\int_0^{\frac{\pi}{2}} \frac{1}{\sqrt{\sin x}}\,dx \times \int_0^{\frac{\pi}{2}} \sqrt{\sin x}\,dx$ is

(a) π (b) $\sqrt{\pi}$ (c) 1 (d) $\frac{\pi}{2}$

7. For what maximum value of x in the interval $[0,\infty)$ can you replace $ln(1+x)$ by $x-\frac{x^2}{2}$ with an error of magnitude no greater than 4% of x.

(a) 0.02 (b) 0.01 (c) 0.04 (c) 0.05

8. The point of inflection for the curve $f(x)=(x+1)^{1/3}$ is

(a) (-1, 0) (b) (1, 0) (c) (-1, 0) (d) (2, 7)

9. The integral $\int_1^2 \frac{\sqrt{x}}{\log x}dx$ is

(a) Divergent (b) Converges to 2 (c) converges to 1 (d) None of these

10. If n is positive integer, then the value of $\frac{2^n\Gamma\left(n+\frac{1}{2}\right)}{1.3.5.....(2n-1)}$ is

(a) π (b) $\sqrt{\pi}$ (c) 1 (d) None of these