QUIZ 1 Applied Calculus

3wightage =12 marks

Q.1: Prove: $\lim_{n\to\infty}\left(1+\frac{2}{n}\right)^{n}=1$

Q.2: Find formulas for fog and gof if $f(x)=\sqrt{x-3}, g(x)=\frac{x+1}{1-x}$.

Q.3: For what value of 'k' so that $f(x)$ is continuous

$$f(x)=\begin{cases}7x-2, & x\le 1\\ kx^{2}, & x>1\end{cases}$$

Also find differentiability of function.

Q#4. Evaluate: $\int xe^{x}\,dx$

Roll No: Section:

FAST – National University of Computer & Emerging Sciences

Computer Science Department

QUIZ

CALCULUS AND ANALYTICAL GEOMETRY

Time Allowed: 25 min FALL 2023 Max. Marks: 3marks 15 point

Q#1.Use L' Hospital's rule to find the limits of the following. [10 Points]

$$(i)\ \lim_{t\to 0}\frac{te^{3t}-t}{1-\cos(2t)} \qquad (ii)\ \lim_{x\to 0^+}\left(\frac{1}{x}-\frac{1}{\sin x}\right)$$

Q#2. Find the values of a *and* b that makes f(x) is continues everywhere.

$$f(x)=\begin{cases}\dfrac{x^2-4}{x-2}, & x<2\\ ax^2-bx+3, & 2\le x\le 3\\ 2x-a-b, & x\ge 3\end{cases}$$

Roll No: Section:

FAST – National University of Computer & Emerging Sciences

Computer Science Department

QUIZ

CALCULUS AND ANALYTICAL GEOMETRY

Time Allowed: 25 min FALL 2023 Max. Marks: 3marks 15 point

Q#1.Use L' Hospital's rule to find the limits of the following. **[10 Points]**

$$\text{(i)}\lim_{x \to \frac{\pi}{4}}(1 - tanx)\, sec2x\,, \quad (ii)\ \lim_{x \to 0^+}\left(\frac{1}{x} - \frac{1}{\sin x}\right)$$

Q#2. Find values of the constants **k** and **m**, if possible that will make the function **f** continuous everywhere. **[5 Points]**

$$f(x) = \begin{cases} x^2 + 5 & x > 2 \\ m(x+1) + k & -1 < x \leq 2 \\ 2x^3 + x + 7 & x \leq -1 \end{cases}$$

Roll No: Section:

FAST -- National University of Computer & Emerging Sciences

Computer Science Department

QUIZ

CALCULUS AND ANALYTICAL GEOMETRY

Time Allowed: 25 min FALL 2023 Max. Marks: 3marks 15 point

Q#1.Use L' Hospital's rule to find the limits of the following. |10 Points|

$$(i)\lim_{x\,,\frac{\pi}{4}}(1-tanx)\,sec2x\,,\quad (ii)\lim_{x\to 0^+}(\frac{1}{x}-\frac{1}{\sin x})$$

Q#2.Find the values of a that makes f(x) is continues everywhere. |5 Points|

$$f(x)=\begin{cases}\dfrac{\sqrt{x+4}-2}{x}+2a & x\neq 0\\ 3a+5-x\ , & x=0\end{cases}$$