Answer the following questions :

Q1 – Complete the Following : **(4 Marks, 1 For Each)**

(a) **The Domain of** $f(x) = \frac{5}{x-3}$ is … … …

(b) $The\ Range\ of\ f(x) = 5 + \sqrt{x-3}\ is$ … … … …

$(c)\ \lim_{x\to 2} \frac{x^2+2x}{x+1} = \cdots$ … … …

(d) **If** $f(x) = \sqrt{x}$, $g(x) = x^2 + 5$, $then\ f\,o\,g(x) =$……

Q2: Choose the Correct Answer : **(4 Marks, 1 For Each)**

$(a)\ \frac{d}{dx}\ [secx] = \cdots$

$(i)sec\ x$ $(ii)tanx$ $(iii)secx\ tanx$ $(iv)none\ of\ them$

(b)**The function** $h(x) = x^3 + 5x$ is … … …

$(i)Even$ $(ii)\ odd$ $(iii)Neither$ $(iv)none\ of\ them$

$(c)\ \lim_{x\to 0} \frac{sinx}{2x} =$

$(i)\ 1$ $(ii)\ 2$ $(iii)\ \frac{1}{2}$ $(iv)\ 0$

$(d)\ \lim_{x\to\infty} \frac{x^2+3x}{2x^3+5}$

$(i)\ \infty$ $(ii)2$ $(iii)\ \frac{1}{2}$ $(iv)\ none\ of\ them$

Question 3: **(6 marks ,3 for each)**

(a) Find the Equation of the Tangent Line for the Function

$f(x) = 3x^2 \quad at\ x = 1$

(**b**) ***Find the Value of the constant k that will Make the function***

$$f(x) = \begin{cases} \frac{x^2-9}{x-3} & , x \neq 3 \\ k+1 & , x = 3 \end{cases} \qquad continuous\ at\ x = 3$$

Question 4: **(6 marks , 3 for each)**

(a) **Find** $f''\left(\frac{\pi}{4}\right)$ **if** $f(x) = \cos x$

(b)**Find the Derivative for each function .**

(i) $f(x) = 3x^{-2} + \tan x$

(ii) $g(x) = x^2 \cot x$

(iii) $h(x) = \frac{x^2-3x}{5x+7}$