

**KING FAHD UNIVERSITY OF PETROLUUM AND  
MINERALS**

**Name:** \_\_\_\_\_

**ID#:** \_\_\_\_\_

**Sec#:** \_\_\_\_\_

**NOTE**

***TO GET FULL MARKS SHOW ALL YOUR WORK***

Q1: If the center of the circle  $x^2 + y^2 - 2ax + 4y - 11 = 0$  is  $(1, -2)$  and its radius is  $r$ , then  $4a - r$ .

Q2: If the Line  $3y + (k-1)x - 1 = 0$  is perpendicular to the Line  $3x + (k+3)y = 3$  then find the value of  $2k$ :

Q3: If  $(2, m)$  is the midpoint of the line segment joining  $(-2, 2n)$  and  $(2n, 2)$ . Then write the equation of the line in the form  $y = mx + b$ :

Q4: If  $f(x) = \frac{4-x}{x}$  and  $g(x) = \frac{4}{x+1}$ , then  $(g \circ f)(k-1) =$  is equal to:

Q5: If  $f(x) = 5x + 2$ ,  $g(x) = ax + b$  and  $(f \circ g)(x) = 5 - 3x$ , find  $a - b$

Q6: The Difference Quotient of  $f(x) = 3 - 5x - 2x^2$  is equal to:

Q7: If  $f(x) = \sqrt{1-x^2}$  and  $g(x) = |x| - 4$ , then  $\text{Domain}\left(\frac{f}{g}\right)(x)$

Q8: The graph of the function  $f(x) = \frac{x-1}{1+2x}$  is reflected with respect to y-axis and translated two units leftward and translated 2 units upward, find the equation of the new graph, and the domain of the new equation.

Q9: Let  $f(x) = \begin{cases} |2-4x| & x < 1 \\ \lfloor 2x-4 \rfloor & x \geq 1 \end{cases}$ , and  $g(x) = x - 2x^2$ ,  $x \leq \frac{1}{4}$

a. Find  $f(-\pi) + f(\pi) =$

b. Sketch  $g(x)$

c. Find  $g^{-1}(x)$

Q10: Determine whether the graph of the equation  $3x^2 = |2x - 5y|$  is symmetric with respect to

a. X-axis

b. Y-axis