

## Important questions 5

Question 1: Let  $A = \{1,2,3,4,5\}$ ,  $B = \{x, y, z, w\}$ , and let  $f: A \rightarrow B$  be given by :

$f = \{(1, w), (2, x), (3, x), (4, y), (5, y)\}$ . Then  $f$  is a :

- [a] An onto *function* from  $A$  to  $B$ .                      [b] A one to one function from  $A$  to  $B$ .  
[c] A 1-1 function from  $A$  to  $B$ .                      [d] A function from  $A$  to  $B$ .

Question 2 : Let  $f: \mathbb{Z} \rightarrow \mathbb{Z}$  be defined by  $f(x) = x^2$ , where  $\mathbb{Z}$  is the set of integers. Then:

- [a]  $f$  is function from  $A$  to  $B$ .                      [b] A one to one function from  $A$  to  $B$  .  
[c] An onto function from  $A$  to  $B$ .                      [d] A 1-1 correspondence.

Question 3: Let  $f: \mathbb{R} \rightarrow \mathbb{R}^+ \cup \{0\}$ , be defined by  $f(x) = x^2$ , where  $\mathbb{R}^+$  is the set of positive real numbers. Then :

- (1) [a]  $f$  is an injection.      [b]  $f$  is surjection.    [c]  $f$  is a bijection.    [d]  $f$  is not a function.  
(2)  $f^{-1}((0,1)) =$   
[a]  $\{-1,1\}$ .    [b]  $(-1,1)$ .    [c]  $[-1,1]$ .    [d]  $\{0, -1,1\}$ .

Question 4: Let  $f: \mathbb{R} \rightarrow \mathbb{R}$  be given by  $f(x) = 2x + 1$ , then :

- (1) [a]  $f$  is a bijection.    [b]  $f$  is an injection.    [c]  $f$  is a surjection.    [d]  $f$  is not a function.  
(2)  $f(\{-1,1\}) =$   
[a]  $\{-1,3\}$ .    [b]  $[-1,3]$ .    [c]  $(-1,3)$ .    [d]  $\{3\}$ .  
(3)  $f^{-1}(x) =$  .  
[a]  $\frac{x-1}{2}$                       [b]  $2x - 1$ .                      [c]  $x - \frac{1}{2}$ .                      [d]  $x$ .

Question 5: Let  $f: \mathbb{Z} \rightarrow \mathbb{Z}$ ,  $g: \mathbb{Z} \rightarrow \mathbb{Z}$ , be defined as follows:

$f(x) = 2x + 3$ , and  $g(x) = 3x - 2$ . Then

- (1)  $(f + g)(x) =$   
[a]  $5x+1$ .    [b]  $5x-6$ .    [c]  $6x+1$ .    [d]  $x+1$ .  
(2)  $(fg)(x) =$   
[a]  $6x^2 - 6$ .    [b]  $6x^2 + 5x - 6$ .    [c]  $x^2 + 6x + 5$ .    [d]  $6x^2 - 3x + 6$ .  
(3)  $(f \circ g)(x) =$   
[a]  $6x-1$ .    [b]  $6x+7$ .    [c]  $6x+1$ .    [d]  $x+1$ .

(4)  $(g \circ f)(x) =$

- [a]  $6x+7$ .    [b]  $6x+1$ .    [c]  $x+1$ .    [d]  $6x-1$ .

Question 6: Let  $f: \mathbb{R} \rightarrow \mathbb{R}$ ,  $g: \mathbb{R} \rightarrow \mathbb{R}$  be defined by:

$$f(x) = 5x + 2 \quad \text{and} \quad g(x) = \frac{x-2}{5}.$$

(1)  $(f \circ g)(x) =$

- [a]  $x$ .    [b]  $\frac{26}{5}x + \frac{8}{5}$ .    [c]  $x^2 - 6$ .    [d]  $4x - \frac{2}{5}$ .