

# CHAPTER - 10

## Functions

EE24BTECH11039 - Ranjith

### I. A: FILL IN THE BLANKS

1) The values of  $f(x) = 3 \sin\left(\sqrt{\frac{\pi^2}{16} - x^2}\right)$  lie in the interval .....

(1983 - 1 Mark)

2) For the function  $f(x) = \begin{cases} \frac{x}{1+e^{1/x}}, & x \neq 0 \\ 0, & x = 0 \end{cases}$  the derivative from the right,  $f'(0+) = \dots$ , and the derivative from the left,  $f'(0-) = \dots$

(1983 - 2mark)

3) The domain of the function  $f(x) = \sin^{-1}\left(\log_2\left(\frac{x^2}{2}\right)\right)$  is given by ...

(1984 - 2mark)

4) Let  $A$  be a set of  $n$  distinct elements. Then the total number of distinct functions from  $A$  to  $A$  is \_\_\_\_\_ and out of these \_\_\_\_\_ are onto functions.

(1985- 2mark)

5) If  $f(x) = \sin\left[\ln\left(\frac{\sqrt{4-x^2}}{1-x}\right)\right]$ , then domain of  $f(x)$  is ... and its range is .....

(1985 - 2Mark)

6) There are exactly two distinct

linear functions,...and...which map  $[-1,1]$  onto  $[0,2]$

(1989 - 1Mark)

7) If  $f$  is a even function defined on the interval  $(-5,5)$ , then four real values of  $x$  satisfying the equation  $f(x) = f\left(\frac{x+2}{x+1}\right)$  are..... and.....

(1996 - 1mark)

### II. B: TRUE / FALSE

1) If  $f(x) = (a - x^n)^{1/n}$  where  $a > 0$   $n$  is a positive integer then  $f(f(x)) = x$ .

(1983 - 1Mark)

2) The function  $f(x) = \frac{x^2+4x+30}{x^2-8x+18}$  is not one-to one.

(1983 - 1Mark)

3) If  $f_1(x)$  and  $f_2(x)$  are defined on domains  $D_1$  and  $D_2$  respectively, then  $f_1(x) + f_2(x)$  is defined on  $D_1 \cup D_2$ .

(1988 - 1Mark)

### III. C: MCQ's WITH ONE CORRECT ANSWER

1) Let  $R$  be the set of real numbers. If  $f : R \mapsto R$  is a function defined by  $f(x) = x^2$ , then  $f$  is:

- a) Injective but not surjective
- b) Surjective but not injective
- c) Bijective
- d) None of these.

(1987)

2) The entire graphs of the equation  $y = x^2 + kx - x + 9$  is strictly above the x-axis if and only if

- a)  $k < 7$
- b)  $-5 < k < 7$
- c)  $k > -5$
- d) None of these.

(1979)

3) Let  $f(x) = |x - 1|$ . then

- a)  $f(x^2) = (f(x))^2$
- b)  $f(x + y) = f(x) + f(y)$
- c)  $f(|x|) = |f(x)|$
- d) None of these.

(1983 - 1Mark)

4) If x satisfies  $|x - 1| + |x - 2| + |x - 3| \geq 6$ , then

- a)  $0 \leq x \leq 4$
- b)  $x \leq -2$  or  $x \geq 4$
- c)  $x \leq 0$  or  $x \geq 4$
- d) None of these.

(1983-1Mark)