CHAPTER - 10
Functions

EE24BTECH11039 - Ranjith

1 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, $f'(0+)$ =..... , and the derivative from the left, $f'(0-)$ =.....

(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)

2 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)

3 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 surgective
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) $f\left(x^2\right) = ((x))^2$
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)