

CHAPTER - 10

Functions

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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, $f'(0+) = \dots$, 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)

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 surjective | c) Bijective |
| b) Surjective but not injective | 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) $k < 7$ | c) $k > -5$ |
| b) $-5 < k < 7$ | d) None of these. |

(1979)

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

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

(1983 - 1Mark)

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

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

(1983-1Mark)