

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 ...
(1983-1mark)
- 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 - 2marks)
- 3) The domain of the function $f(x) = \sin^{-1}\left(\log_2\left(\frac{x^2}{2}\right)\right)$ is given by ...
(1984 - 2marks)
- 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- 2marks)
- 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 - 2Marks)
- 6) There are exactly two distinct linear functions, ... and ... which map $[-1,1]$ onto $[0,2]$
(1989 - 1Mark)
- 7) If f is an 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 $f: R \rightarrow R$ 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)