CHAPTER-2
RELATIONS & FUNCTIONS
05 MARK TYPE QUESTIONS

Q. NO	**QUESTION**	**MARK**
1.	Find the set of values for which the function f(x) = x + 3 and g(x) = $3x^2 - 1$ are equal	5
2.	Find domain and Range of f(x) = $\frac{1}{1-2\cos x}$	5
3.	If $f(x) = y = \frac{ax-b}{(cx-a)}$, then Prove that $f(y) = x$	5
4.	If $f: R \to R$ satisfies $f(x+y) = f(x) + f(y)$ for all $x, y \in R$ and $f(1) = 7$, fin$\sum_{r=1}^{n} f(r)$	5

ANSWERS:

Q. NO	ANSWER	MARKS
1.	$f(x) = x + 3$, $g(x) = 3x^2 – 1$ To find:- Set of values of x for which $f(x) = g(x)$ Consider, $f(x) = g(x)$ $x+3 = 3x^2 – 1$ $3x^2 - x – 4 = 0$ $3x^2 - 4x + 3x - 4 = 0$ $x(3x-4) +(3x-4) = 0$ $(3x - 4)(x + 1) = 0$ $x = 4/3$ or $x= -1$ The set values for which f(x) and g(x) have same value is { 4/3 , -1}.	5
2.	Given function $f(x) = \frac{1}{1-2cosx}$ **Domain:** $$1 - 2cosx = 0$$ Cosx = ½ Cosx= $Cos(\frac{\pi}{3})$ We know that Cosx= Cos α $X=2n\pi \pm \alpha$ Here $X=2n\pi \pm \frac{\pi}{3}$ **So f(x) is defined if** $X \neq 2n\pi \pm \frac{\pi}{3}$ So domain of f(x) all real number except $2n\pi \pm \frac{\pi}{3}$ Domain is: **R-{**$2n\pi \pm \frac{\pi}{3}$**} where n is integer**	5

	Range: We know that **$-1 \le \cos x \le 1$** **$-2 \le 2\cos x \le 2$** **$3 \le 1-2\cos x \le -1$** **$-1 \le \frac{1}{1-2\cos x} \le \frac{1}{3}$** Range is:$[-1, \frac{1}{3}]$	
3.	We have, $y = \frac{ax-b}{(cx-a)}$ $\Rightarrow ycx - ay = ax - b$ $\Rightarrow ycx - ax = ay - b$ $\Rightarrow x(cy-a) = ay - b$ $\Rightarrow x = \frac{ay-b}{cy-a}$ $\Rightarrow x = f(y)$ or $f(y) = x$	
4.	$\sum_{r=1}^{n} f(x) = f(1) + f(2) + f(3) + \cdots + f(n)$ $= f(1) + 2f(1) + 3f(1) + \cdots + nf(1)$ $\because f(x+y) = f(x) + f(y)$ $f(1+1) = f(1) + f(1) = 2f(1)\ and\ so\ on$ $= (1+2+3+\cdots+n)f(1)$ $= \frac{n(n+1)}{2} f(1)$ $= \left(\frac{n+1}{2}\right)(7) = \frac{7n(n+1)}{2}$	