Q.1.	If $f(x) = \begin{cases} 2x, & x < 0 \\ 3x^2, & 0 \le x < 4, \\ 3x, & x \ge 4 \end{cases}$ then f (-1) + f(2) + f(4) is equal to _____ .						
	A	10	**B**	7	**C**	12	**D**	22

Q.2.	The range of the function f(x) $= \frac{|x-1|}{x-1}, x \neq 1$ is						
	A	$\{1, -1\}$	**B**	R	**C**	$[-1, 1]$	**D**	None of these

Q.3.	Let $f: R \to R: f(x) = x^3, then\ f\ is$						
	A	bijective	**B**	one to one but not onto	**C**	not one to one but onto	**D**	None of these

Q.4.	The number of one-one functions from set A $= \{1,2,3,4\}$ to itself is						
	A	4	**B**	16	**C**	24	**D**	27

Q.5.	If $f : R \to R$ is defined by $f(x) = 5x + 3, then\ f\ is$						
	A	neither one-one nor onto	**B**	many one onto	**C**	one to one but not onto	**D**	one-one and onto

Q.6.	If $f : R \to R$ is defined by $f(x) = [x], \forall\ x \in R, then\ f\ is$						
	A	One-one onto	**B**	Neither one-one nor onto	**C**	*many one onto*	**D**	One-one but not onto

Q.7.	The number of functions from set A $= \{1,2,3,4\}$ to B $= \{5, 6, 7\} =$ _____ .						
	A	12	**B**	64	**C**	81	**D**	2^{12}

Q.8.	Let $f : R - \left\{-\frac{4}{3}\right\} \to R - \left\{-\frac{4}{3}\right\}$ be a function defined as $f(x) = y = \frac{4x}{3x+4}$, then x $=$						
	A	$\dfrac{3y}{3 - 4y}$	**B**	$\dfrac{4y}{4 - 3y}$	**C**	$\dfrac{4y}{3 - 4y}$	**D**	$\dfrac{3y}{4 - 3y}$

	In the following questions (9 and 10), a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices. A) Both A and R are true and R is the correct explanation of A. B) Both A and R are true but R is not the correct explanation of A. C) A is true but R is false. D) A is false but R is true.
Q9	(A) If f(x) = x^2, $f: N$ to N then f is a bijective function
	(R) A function is bijective if and only if f is one to one and onto.
Q10.	(A) If $f(x) = [x]$, $f: R$ to Z, then f is onto.
	(R) A function is onto if codomain = range of the function
Q11.	Let $f : N \rightarrow S$, where S is range of f, such that $f(x) = 4x^2 + 12x + 15$, then find x if $f(x) = 31$
Q12.	Show that the function f: R→R defined by f(x) = $\frac{2x-1}{3}$, x ∈ R is one –one and onto function.
Q13.	If f(x) = $\frac{3x+2}{2x-3}$, $x \neq \frac{3}{2}$, Prove f is one to one.
Q14.	Consider the function f: $R_+ \rightarrow [4, \infty[$ defined by $f(x) = x^2 + 4$, where R_+ is the set of all non negative real numbers. Show that f is invertible.
Q15.	$f(x) = \frac{x}{1+x^2}$ $f: R$ to $\left[-\frac{1}{2}, \frac{1}{2}\right]$. Check whether f is one to one and onto.
Q16.	Let $f: N \rightarrow N$ be defined by $f(n) = \begin{cases} \frac{n+1}{2}, & if\ n\ is\ odd \\ \frac{n}{2}, & if\ n\ is\ even \end{cases}$. Show that the function is not bijective.
Q17.	Let $f : [0, \infty) \rightarrow [31, \infty)$ such that $f(x) = 4x^2 + 12x + 15$. Show that f is invertible.
Q18.	Let the function f: $[0, \infty) \rightarrow R$ be a function defined by $f(x) = 9x^2 + 6x - 5$. Prove that f is one to one but not onto. Modify, only the codomain of f to make f onto.
Q19	Case study questions: Students of Grade 12, planned to plant saplings along straight lines, parallel to each other to one side of the playground ensuring that they had enough play area. Let us assume that they planted one of the rows of the saplings along the line $y=x+4$. Let L be the set of all lines which are parallel on the ground and R be a relation on L. Based on the above information, answer the following: a) Let R be a relation such that R= $\{(L_1, L_2): L_1 \parallel L_2, L_1, L_2 \in L\}$. Is R an equivalence relation? Why? b) If $f(x) = x + 4$, $f: N$ to N, then check f is one to one or onto. c) Write the range of the following functions: i) f(x) =$x^2 + 1$, $x \in R$ $$ii)\ f(x) = \sqrt{4 - x^2}, x \in [-2, 2]$$

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A n s w e r	1	D	2	A	3.	A	4	C
	5	D	6	B	7	C	8	B
	9	D	10	A	11	1	12	Onto but not one to one
	19	a) Yes b) One to one only. c) i) $[1, \infty)$ ii) $[0, 2]$						

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