Classification

1. The function $f : R \to R, f(x) = x^2, \forall x \in R$ is   [MP PET 1997]
(a) Injection but not surjection
(b) Surjection but not injection
(c) Injection as well as surjection
(d) Neither injection nor surjection

2. If for two functions g and f, gof is both injective and surjective, then which of the following is true
                                                                    [Kurukshetra CEE 1998]
(a) g and f should be injective and surjective
(b) g should be injective and surjective
(c) f should be injective and surjective
(d) None of them may be surjective and injective

3. The function which map [–1, 1] to [0, 2] are   [Kurukshetra CEE 1998]
(a) One linear function
(b) Two linear function
(c) Circular function
(d) None of these

4. Function $f : R \to R, f(x) = x^2 + x$ is   [RPET 1999]
(a) One-one onto   (b) One-one into
(c) Many-one onto   (d) Many-one into

5. Mapping $f : R \to R$ which is defined as $f(x) = \cos x, x \in R$ will be   [UPSEAT 1999]
(a) Neither one-one nor onto
(b) One-one
(c) Onto
(d) One-one onto

6. The function $f : R \to R$ defined by $f(x) = (x-1) \ (x-2)(x-3)$ is   [Roorkee 1999]
(a)   One-one but not onto   (b)Onto but not one-one
(c)   Both one-one and onto   (d)Neither one-one nor onto

7. If $f : R \to R$, then $f(x) = |x|$ is   [RPET 2000]
(a)   One-one but not onto   (b) Onto but not one-one
(c)   One-one and onto   (d) None of these

8. Let $f : N \to N$ defined by $f(x) = x^2 + x + 1$, $x \in N$, then f is   [AMU 2000]
(a)   One-one onto   (b)Many one onto
(c)   One-one but not onto (d)None of these

9. Let X and Y be subsets of R, the set of all real numbers. The function $f : X \to Y$ defined by $f(x) = x^2$ for $x \in X$ is one-one but not onto if (Here R^+ is the set of all positive real numbers)

[EAMCET 2000]

(a) $X = Y = R^+$ (b) $X = R, Y = R^+$

(c) $X = R^+, Y = R$ (d) $X = Y = R$

10. Set A has 3 elements and set B has 4 elements. The number of injection that can be defined from A to B is   [UPSEAT 2001]
(a) 144   (b) 12
(c) 24   (d) 64

11. Let $f : R - \{n\} \to R - \{m\}$ be a function defined by $f(x) = \frac{x - m}{x - n}$, where $m \neq n$. Then

[UPSEAT 2001]

(a)   f is one-one onto   (b) f is one-one into
(c)   f is many one onto   (d) f is many one into

12. The function $f : R \to R$ defined by $f(x) = e^x$ is   [Karnataka CET 2002; UPSEAT 2002]
(a)   Onto   (b) Many-one
(c)   One-one and into   (d) Many one and onto

13. Which one of the following is a bijective function on the set of real numbers

[Kerala (Engg.) 2002]

(a) $2x - 5$ (b) $|x|$
(c) x^2 (d) $x^2 + 1$

14. Let $f(x) = \frac{x^2 - 4}{x^2 + 4}$, then the function $f : (-\infty, -2] \cup [2, \infty) \to (-1, 1)$ is   [Orissa JEE 2002]
(a)   One-one into   (b) One-one onto
(c)   Many one into   (d) Many one onto

15. Let the function $f : R \to R$ be defined by $f(x) = 2x + \sin x, x \in R$. Then f is   [IIT Screening 2002]
(a) One-to-one and onto
(b) One-to-one but not onto
(c) Onto but not one-to-one
(d) Neither one-to-one nor onto

16. A function f from the set of natural numbers to integers defined by $f(n) = \begin{cases} \frac{n-1}{2}, & \text{when } n \text{ is odd} \\ -\frac{n}{2}, & \text{when } n \text{ is even} \end{cases}$, is

[AIEEE 2003]

(a)   One-one but not onto   (b) Onto but not one-one
(c)   One-one and onto both   (d) Neither one-one nor onto

17. If $f : [0, \infty) \to [0, \infty)$ and $f(x) = \dfrac{x}{1+x}$, then f is   [IIT Screening 2003]

(a)   One-one and onto   (b) One-one but not onto
(c)   Onto but not one-one (d) Neither one-one nor onto

18. If $f : R \to S$ defined by $f(x) = \sin x - \sqrt{3} \cos x + 1$ is onto, then the interval of S is

[AIEEE 2004; IIT Screening 2004]

(a)   [–1, 3]   (b) [1, 1]
(c)   [0, 1]   (d) [0, –1]

19. If R denotes the set of all real numbers then the function $f : R \to R$ defined $f(x) = [x]$

[Karnataka CET 2004]

(a)   One-one only   (b) Onto only
(c)   Both one-one and onto   (d) Neither one-one nor onto

20. $f(x) = x + \sqrt{x^2}$ is a function from $R \to R$, then $f(x)$ is

[Orissa JEE 2004]

(a)   Injective   (b) Surjective
(c)   Bijective   (d) None of these

21. If $(x, y) \in R$ and $x, y \neq 0$; $f(x, y) \to \dfrac{x}{y}$, then this function is a/an   [Orissa JEE 2004]

(a) Surjection   (b) Bijection
(c) One-one   (d) None of these

ANSWER KEY

QUE.	1	2	3	4	5	6	7	8	9
ANS.	D	C	B	D	A	B	D	C	C
QUE.	10	11	12	13	14	15	16	17	18
ANS.	C	A	C	A	C	A	C	B	A
QUE.	19	20	21						
ANS.	D	D	A						