ONE MARK QUESTION FOR PRACTICES

CHAPTERWISE/TOPICWISE

RELATION AND FUNCTIONS

1. Let A={1, 2, 3} and let R={ (1, 1), (2, 2) , (3, 3), (1, 3), (3, 2), (1, 2)}. The R is

   (a) reflexive and symmetric but not transitive

   (b) reflexive and transitive but not symmetric

   (c) symmetric and transitive but not reflexive

   (d) an equivalence relation

2. Let A= {a, b, c} and Let R= {(a, a), (a, b), (b, a)}. Then R is

   (a) reflexive and symmetric but not transitive

   (b) reflexive and transitive but not symmetric

   (c) symmetric and transitive but not reflexive

   (d) an equivalence relation

3. Let A={1, 2, 3} and let R={ (1, 1), (2, 2) , (3, 3), (1, 2), (2, 1), (2, 3),(3, 2)}. The R is

   (a) reflexive and symmetric but not transitive

   (b) reflexive and transitive but not symmetric

   (c) symmetric and transitive but not reflexive

   (d) an equivalence relation

4. Let S be the set of all straight lines in a plane. Let R be the relation S defined by aRb $\Leftrightarrow a \perp b$.Then R is

   (a) reflexive but neither symmetric nor transitive

   (b) symmetric but neither reflexive nor transitive

   (c) transitive but neither reflexive nor symmetric

   (d) an equivalence relation

5. Let S be the set of all straight lines in a plane. Let R be the relation S defined by aRb $\Leftrightarrow a \parallel b$. Then R is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) symmetric and transitive but not reflexive

(d) an equivalence relation

6. Let Z be the set of all integers and let R be a relation on Z defined by aRb $\Leftrightarrow$ (a-b) is divisible by 3. Then R is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) symmetric and transitive but not reflexive

(d) an equivalence relation

7. Let N be the set of all natural numbers and let R be a relation on N defined by aRb $\Leftrightarrow$ a is factor of b. Then R is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) symmetric and transitive but not reflexive

(d) an equivalence relation

8. Let Z be the set of all integers and let R be a relation on Z defined by aRb $\Leftrightarrow$ ($a \geq b$). Then R is

(a) symmetric and transitive but not reflexive

(b) reflexive and symmetric but not transitive

(c) reflexive and transitive but not symmetric

(d) an equivalence relation

9. Let S be the set of all real numbers. Let R be the relation S defined by aRb $\Leftrightarrow |a| \leq b$

Then R is

(a) reflexive but neither symmetric nor transitive

(b) symmetric but neither reflexive nor transitive

(c) transitive but neither reflexive nor symmetric

(d) None of these

10. Let S be the set of all real numbers. Let R be the relation S defined by aRb $\Leftrightarrow$ $|a - b| \leq 1$. Then R is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) symmetric and transitive but not reflexive

(d) an equivalence relation

11. Let S be the of all real numbers and let R be a relation on S, defined by a R b $\Leftrightarrow$

(1 + ab) > 0 Then, R is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) symmetric and transitive but not reflexive

(d) none of these

12. Let S be the set of all triangles in a plane and let R be a relation on S defined by $\Delta_1 S \Delta_2 \Leftrightarrow \Delta_1 \equiv \Delta_2$. Then, R is

(a) Reflexive and symmetric but not transitive
(b) Reflexive and transitive but not symmetric
(c) Symmetric and transitive but not reflexive
(d) An equivalence relation

13. Let S be the set of all real numbers and let R be a relation on S defined by a R b $\Leftrightarrow$

$a^2 + b^2 = 1$. Then, R is

(a) symmetric but neither reflexive nor transitive

(b) reflexive but neither symmetric nor transitive

(c) transitive but neither reflexive nor symmetric

(d) none of these

14. Let R be a relation on N $\times$ N , defined by (a,b) R (c,d) $\Leftrightarrow$ a + d = b + c Then, R is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) symmetric and transitive but not reflexive

(d) an equivalence relation

15. Let A be the set of all points in a plane and let O be the origin, Let $R = [(P, Q) : OP = OQ]$. Then, R is

(a) reflexive and symmetric but not transitive

(b) reflexive and transitive but not symmetric

(c) symmetric and transitive but not reflexive

(d) an equivalence relation

16. $F : N \to N : f(x) = 2x$ is

(a) one-one and onto
(b) one-one and into
(c) many-one and onto
(d) many-one and into

17. $f : N \to N : f(x) = x^2+x+1$ is

(a) one-one and onto

(b) one-one and into

(c) many-one and onto

(d) many-one and into

18. $f : R \to R : f(x) = x^2$ is

(a) one-one and onto

(b) one-one and into

(c) many-one and onto

(d) many-one and into

19. $f : R \to R : f(x) = x^3$ is

(a) one-one and onto

(b) one-one and into

(c) many-one and onto

(d) many-one and into

20. $f : R^{+} \rightarrow R^{+} : f(x) = e^{x}$ is

(a) many – one and into

(b))many – one and onto

(c) one-one and into

(d) one-one and onto

21 $f : \left[-\frac{\pi}{2}, \frac{\pi}{2}\right] \rightarrow [-1, 1] : f(x) = \sin x$ is

(a) one-one and into

(b) one-one and onto

(c) many-one and into

(d) many-one and onto

22. $f : R \rightarrow R : f(x) = \cos x$ is

(a) one-one and into

(b) one-one and onto

(c) many-one and into

(d) many-one and onto

23. $f : C \rightarrow R : f(z) = |z|$ is

(a) one-one and into

(b) one-one and onto

(c) many-one and into

(d) many-one and onto

24. Let A = R - [3] and B = R -[1] . Then , $f: A \rightarrow B : f(x) = \frac{x-2}{x-3}$ is

(a) one-one and into

(b) one-one and onto

(c) many-one and into

(d) many-one and onto

25. Let f : N$\rightarrow$N:f(n)= $\begin{cases} \frac{n+1}{2} \\ \frac{n}{2} \end{cases}$ Then, f is

(a) One-one and into
(b) One-one and onto

(c) Many-one and into

(d) Many-one and onto

26. Let A and B be two non-empty sets and let f : (A x B)$\rightarrow$(B x A):f(a,b) = (b,a) . Then, f is

(a) one-one and onto

(b) one-one and into

(c) many-one and onto

(d) many-one and into

27. Let f : Q $\rightarrow$Q : f(x) = (2x + 3), Then, $f^{-1}(y)$ =?

(a) (2y - 3) (b) 1/(2y - 3) (c) ½ (y - 3) (d) none of these

28. Let f : R –{-4/3}$\rightarrow R-\{4/3\}$:f(x)=$\frac{4x}{3x+4}$ .Then, f^{-1}(y)=?

(a) 4y/(4-3y) (b) 4y/(4+3y) (c) 4y/(3y-4) (d) none of these

29. Let f : N$\rightarrow$ X : f(x) = $4x^2$ + 12x + 15. Then, f^{-1} (y)=?

(a) $\frac{1}{2}\left(\sqrt{y-4}+3\right)$ (b) $\frac{1}{2}\left(\sqrt{y-6}-3\right)$ (c) $\frac{1}{2}\left(\sqrt{y-4}+5\right)$ (d) none of these

30. If: f (x) = $\frac{4x+3}{6x-4}$, x $\neq$ 2/3 then (f o f) (x) = ?

(a) x^2 (b) (2x - 3) (c) $\frac{4x-6}{3x+4}$ (d) none of these

31. If f (x) = $(x^2 - 1)$ and g(x) = (2x + 3) then (g o f) (x) = ?

(a) $(2x^2 + 3)$ (b) $(3x^2 + 2)$ (c) $(2x^2 + 1)$ (d) none of these

32. If $f\left(x+\frac{1}{x}\right)=x^2+\frac{1}{x^2}$,then f (x) = ?

(a) x^2 (b) $(x^2 - 1)$ (c) $(x^2 - 2)$ (d) none of these

33. If f (x) = $\frac{1}{1-x}$, then (f o f o f) (x) = ?

(a) 1/ (1 - 3x) (b) x / (1 + 3x) (c) x (d) none of these

34. If f(x) = $\sqrt[3]{3-x^3}$ then (f o f) (x) = ?

(a) $x^{1/3}$ (b) x (c) $(1 - x^{1/3})$ (d) none of these

35. If f (x) = $x^2 - 3x + 2$ then (f o f) (x) = ?

(a) x^4 (b) $x^4 - 6x^3$ (c) $x^4 - 6x^3 + 10x^2$ (d) none of these

36. If f (x) = $8x^3$ and g(x) = $x^{1/3}$ then (g o f) (x) = ?

(a) x (b) 2x (c) x/2 (d) $3x^2$

37. If f(x) =x^2, g(x) = tan x and h (x) = log x then {h o (g o f)} ($\sqrt{\pi/4}$)=?

(a) 0 (b) 1 (c) 1/x (d) $\frac{1}{2}\log\frac{\pi}{4}$

38. If f={(1,2),(3,5),(4,1)} and g={(2,3),(5,1),(1,3)} then (g o f) = ?

(a) {(3,1), (1,3), (3,4)} (b) {(1,3), (3,1), (4,3)}

(c) {(3,4), (4,3), (1,3)} (d) {(2,5), (5,2), (1,3)}

40. Let f (x) = $\sqrt{9-x^2}$ Then, Dom (f) =?

(a) [-3, 3] (b) $(-\infty, -3]$ (c) $[3, \infty)$ (d) $(-\infty, -3]\cup(4,\infty)$

41. Let f (x)=$\sqrt{\frac{x-1}{x-4}}$.Then, dom (f)=?

(a) [1,4) (b) [1,4] (c) $(-\infty,4]$ (d) $(-\infty,1]\cup(4,\infty)$

42. Let f(x) = $e^{\sqrt{x^2-1}}$. log (x-1), Then, dom (f)= ?

(a) $(-\infty, 1]$ (b) $[-1, \infty)$ (c) $(1, \infty)$ (d) $(-\infty, -1] \cup (1, \infty)$

43. Let f (x) $= \frac{x}{x^2 - 1}$. Then, dom (f) =?

(a) R (b) R - {1} (c) R -{ -1} (d) R - { -1 , 1}

44. Let f(x)= $\frac{\sin^{-1} x}{x}$, Then, dom (f)

(a) (-1,1) (b) [-1,1] (c) [-1,1] - [0] (d) none of these

45. Let f (x) = $\cos^{-1} 2x$. Then, dom (f) =?

(a) [-1,1] (b) $[-\frac{1}{2}, \frac{1}{2}]$ (c) $[-\frac{\pi}{2}, \frac{\pi}{2}]$ (d) $[-\frac{\pi}{4}, \frac{\pi}{4}]$

46. Let f (x) = $\cos^{-1} (3x - 1)$, Then, dom (f) = ?

(a) $(0, \frac{2}{3})$ (b) $\left[0, \frac{2}{3}\right]$ (c) $\left[-\frac{2}{3}, \frac{2}{3}\right]$ (d) none of these

47. Let f(x) = $\sqrt{\cos x}$, Then, dom (f) = ?

(a) $[0, \frac{\pi}{2}]$ (b) $[\frac{3\pi}{2}, 2\pi]$ (c)) $[0, \frac{\pi}{2}] \cup [\frac{3\pi}{2}, 2\pi]$ (d) none of these

48. Let f (x) $= x^2$, , Then, dom (f) and range (f) are respectively

(a) R and R (b) R^+ and R^+ (c) R and R^+ (d) R and R – (0)

49. Let f (x)= x^3, Then, dom (f) and range (f) are respectively

(a) R and R (b) R^+ and R^+ (c) R and R^+ (d) R^+ and R

50. Let f (x) = log (1 – x) + $\sqrt{x^2 - 1}$. Then, dom (f) =?

(a) $(1, \infty)$ (b) $(-\infty, -1]$ (c) [-1, 1) (d) (0,1)

51. Let f (x) = $\frac{1}{(1 - x^2)}$. Then range (f) =?

(a) $(-\infty, 1]$ (b) $[1, \infty)$ (c) [-1, 1] (d) none of these

52. Let f (x) = $\frac{x^2}{(1 + x^2)}$.Then , range (f) = ?

(a) $[1,\infty)$ (b) $[0,1)$ (c) $[-1, 1]$ (d) $(0,1]$

53. The range of f(x) = $x+\frac{1}{x}$ is

(a) $[-2, 2]$ (b) $[2,\infty)$ (c) $(-\infty, -2]$ (d) none of these

54. The range of f (x)=a^x , where a > 0 is

(a) $[-\infty,0]$ (b) $[-\infty,0)$ (c) $[0, \infty)$ (d) $(0,\infty)$

55. If $f(x) = x^2 - 1$ *and* $g(x) = \sqrt{x}$, *then* $gof(1)$ *is* :

(a) -1 (b) 0 (c) 1 (d) 2.

56. If $f(x) = x^2 + 2$ *and* $g(x) = 3x+1$, *then* $fog(2)$ *is* :

(A) 19 (B) 50 (C) 51 (D) 49.

57. If $f(x) = e^x$ *and* $g(x) = \log(x)$ then $(fog)(1)$ *is* :

(A) e (B) 0 (C) 1 (D) 2.

58. $f(x) = \begin{cases} 3x-1, & when \quad x>1 \\ -x, & when \quad x \le 1, \end{cases}$ *the value* of $f(0)$ *is* :

(a) -1 (b) 0 (c) 1 (d) 2.

59. If the function $f(x)$ is defined as :

$f(x) = \begin{cases} 3x+1, & when \quad x>1 \\ -x, & when \quad x \ge 1, \end{cases}$ *the value* of $f(2)$ *is* :

(a) -2 (b) 2 (c) 4 (d) 7

60. If $f(x) = \begin{cases} 3x-1, & when \quad x>1 \\ -x & when \quad x<1, \end{cases}$ *the value* o $f(-2)$ *is* :

(a) 2 (b) -2 (c) -7 (d) 5

61. Let S ={1, 4, 5} and f : S$\rightarrow$S is defined by f = { (1, 1),(4, 5), (5, 4)}. f^{-1} is equal to

(a) {(1, 1), (5, 4), (4, 5)}

(b) {(1, 1), (4, 4), (5, 5)}

(c) does not exist

(d) None of these.

62. If $f : R \to R$ *is given by* $f(x) = 4x - 1$ *and* $g : R \to R$ *is given by* $g(x) = x^3 + 2$, then the value of $(fog)(1)$ *is* :

(a) 29 (b) 11 (c) 31 (d) none of these.

63. If $f : R \to R$ *given by* $f(x) = x^3 + 5$, then $f^{-1}(x)$ *is* :

(a) $(x - 5)^{1/3}$ (b) $(x + 5)^{1/3}$ (c) $(x - 5)^3$ (d) none of these.

RELATION AND FUNCTIONS : ANSWERS

1.b	2.c	3.a	4.b	5.d	6.d	7.b	8.c	9.c	10.a
11.a	12.d	13.a	14.d	15.d	16.b	17.b	18.d	19.a	20.d
21.b	22.c	23.c	24.b	25.d	26.a	27.c	28.a	29.b	30.a
31.c	32.c	33.c	34.b	35.d	36.b	37.a	38.b	39.a	40.d
41.c	42.d	43.c	44.b	45.b	46.c	47.c	48.c	49.a	50.b
51.b	52.b	53.d	54.d	55.b	56.c	57.c	58.b	59.a	60.a
61.a	62.b	63.a							