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Answers Key:

Assertion and reason

1. (a) **Assertion** is correct, **reason** is correct; reason is a correct explanation for assertion.
2. (a) **Assertion** is correct, **reason** is correct; reason is a correct explanation for assertion.
3. (a) **Assertion** is correct, **reason** is correct; reason is a correct explanation for assertion.
4. (a) **Assertion** is correct, **reason** is correct; reason is a correct explanation for assertion.
5. (c) **Assertion** is correct, **reason** is incorrect.
6. (a) **Assertion** is correct, **reason** is correct; reason is a correct explanation for assertion.

Multiple Choice Question

7. Not reflexive, as l_1 R l_2
   $\Rightarrow l_1 \perp l_1$ Not true
   Symmetric, true as l_1 R $l_2 \Rightarrow l_2$R h
   Transitive, false as l_1 R l_2, l_2 R l_3
   $\Rightarrow l_1 \| l_3$. l_1 R l_2.
8. T_1 and T_3 are similar as their sides are proportional.
9. Here (1,2) e R, (2,1) € R, if transitive (1,1) should belong to R.
10. A relation R is an identity relation in set A if for all a ∈ A, (a, a) ∈ R.
11. Reflexive, true as x s x ⇒ x - x + $\sqrt{3}$
    = $\sqrt{3}$ is an irrational number
    Symmetric, fase e.g x = $\sqrt{3}$, y= 2
    x S y ⇒ $\sqrt{3}$ - 2 + $\sqrt{3}$ = 2 $\sqrt{3}$ -2 is an irrational number
    but ySx ⇒ 2 - $\sqrt{3}$ + $\sqrt{3}$ = 2 $\sqrt{3}$ -2 is not irrational number
    transitive, false e.g = x = 1 + $\sqrt{3}$, y = 5 z = 2 $\sqrt{3}$
    x S y ⇒ 1 + $\sqrt{3}$ - 5 + $\sqrt{3}$ = 2 $\sqrt{3}$ - 4 is an irrational number
    y S z ⇒ 5 -2 $\sqrt{3}$ + $\sqrt{3}$ = 5 - $\sqrt{3}$ is an irrational number
    But x S z ⇒ 1 + $\sqrt{3}$ - 2 $\sqrt{3}$ + $\sqrt{3}$ = 1 is an irrational number
12. Total injective mappings/functions
    = $^4P_3$ = 4! = 24.
13. y = f(x)
    ⇒ 5x + 4
    ⇒ $\frac{y-4}{5}$
    ∴ $f^{-1}(y) = \frac{y-4}{5}$
    or $f^{-1}(x) = \frac{x-4}{5}$
14. (c) x
15. (b) $g(y) = \frac{4y}{4-3y}$
16. (c) (1,-2)
17. (b) Symmetric
18. (b) Transitive
19. (d) 4
20. (c) Equivalence relation
21. (b) {(1, 3), (1, 5), (2, 3), (2, 5), (3, 5), (4, 5)}
22. (d) R is reflexive and transitive but not symmetric
23. (a) {4,5,6}
24. (a) Equivalence relation
25. (d) Symmetric
26. (c) Symmetric and reflexive
27. gcg $f(x) = 3\cos^2 x_i f_0(x) = \cos 3x^2$
    At X = 0, gof(x) ≠ fog(x)
28. We know that,
    $0 \le x - [x] < 1$, for all $x \in R$
    $\Rightarrow 1 \le 1 + x - [x] < 2$ for all $x \in R$
    $\Rightarrow 15g(x) < 2$ for all $x \le R$
    $\Rightarrow f(g(x)) = 1, for\ all\ x \in R$
    $[\because f(x) = 1, when x > 0]$
29. (d) neither injective nor surjective.
30. (b) (6,8) ∈ R
31. (b) 4

32. (b) (1, 2)
33. (a) {1, 5, 9}
34. (d) both one-one and onto
35. (b) injective function

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