1. If A and B are sets, then $(A - B) \cup (A \cap B)$ equals

   A. ϕ

   B. B

   C. $A \cap B$

   D. A

   ANSWER: D

2. Let $A = \{1, 2, 3\}, B = \{2, 3, 4\}, C = \{4, 5, 6\}$ and $D = \{6, 7, 8\}$. Then $(A \times C) \cap (B \times D)$ is ——

   A. $\{(2, 6), (3, 6)\}$

   B. $\{(2, 6), (2, 7), (3, 6), (3, 8)\}$

   C. $\{(2, 6), (2, 7), (2, 8), (3, 6)\}$

   D. $\{(2, 6), (2, 7), (3, 7), (3, 8)\}$

   ANSWER: A

3. If the set 'A' has n elements then the number of possible subsets of $A \times A$ is ———

   A. n^2

   B. 2^n

   C. 2^{n^2}

   D. n

   ANSWER: C

4. If $R_1 = \{(1, 2), (2, 3), (3, 4)\}$ and $R_2 = \{(1, 1), (1, 2), (2, 1), (2, 2), (2, 3), (3, 1), (3, 2), (3, 3), (3, 4)\}$ be the relations from $\{1, 2, 3\}$ to $\{1, 2, 3, 4\}$ then — ——-

   A. $R_1 \cup R_2 = R_1$

   B. $R_1 \cap R_2 = R_2$

C. $R_1 - R_2 = \phi$

D. $R_2 - R_1 = \phi$

ANSWER: C

5. The union of two equivalence relation is ————-

   A. equivalance relation

   B. equivalance class

   C. partial ordering relation

   D. not necessarily an equivalance relation

   ANSWER: D

6. If no vertex has loop in a digraph of a relation R, then R is

   A. reflexive

   B. irreflexive

   C. symmetric

   D. antisymmetric

   ANSWER: B

7. For the poset $[\{2, 3, 5, 30, 60, 120, 180, 360\}; divisorof]$, the minimal elements are

   A. 2, 3, 5, 30

   B. 2, 5

   C. 2, 3, 5

   D. 2, 3

   ANSWER: C

8. If $R = \{(x, x^2)\}$ and $S = \{(x, 2x)\}$, where x is a non - negative integer, then $R \cap S$ equals

A. $\{(0,0)\}$

B. does not exist

C. $\{(1,2),(3,4)\}$

D. $\{(0,0),(2,4)\}$

ANSWER: D

9. If g is a function from R to R defined by $g(x) = -2x + 6$, then $g^{-1}(4)$ equals

   A. -1

   B. 3

   C. 1

   D. 2

   ANSWER: C

10. If $f, g : R \to R$ are defined by$f(x) = x + 2$ and $g(x) = 3x$, then $f \circ g$ equals

    A. $x + 2$

    B. $3x$

    C. $3x + 2$

    D. $3x^2 + 2$

    ANSWER: C

11. If f is a function from $S = \{0, 1, 2, 3, 4, 5\}$ to S defined by $f(x) = (4x)$ mod 6, then the ordered pairs of f equals

    A. $\{(0,0),(1,4),(2,2)\}$

    B. $\{(0,0),(1,4),(2,2),(3,0),(4,4),(5,2)\}$

    C. $\{(0,5),(1,3),(3,0),(4,4),(5,2),(1,4)\}$

    D. $\{(0,0),(1,1),(2,2),(3,3)(4,4),(5,5)\}$

ANSWER: B

12. If $f : R \to R$ defined by $f(x) = 3x^3 + x$, then f is

A. neither one to one nor onto

B. onto but not one to one

C. both one to one and onto

D. one to one but not onto

ANSWER: C