1. If a set 'A' has n elements then the power set of A has —— elements

   A. n

   B. n^2

   C. 2^n

   D. 3^n

   ANSWER: C

2. If A, B and C are sets then $A \times (B \cup C)$ is ———

   A. $(A \cap B) \times (A \cap C)$

   B. $(A \times B) \cap (B \times C)$

   C. $(A \times B) \cup (A \times C)$

   D. $(A \times B) \cup (B \times C)$

   ANSWER: C

3. If the relation R is reflexive, symmetric and transitive then the relation R is called ———

   A. poset

   B. equivalence relation

   C. partial order relation

   D. equivalance classes

   ANSWER: B

4. In a poset, the greatest and least element if they exist are ——

   A. more than one

   B. zero

   C. exactly two

   D. unique

   ANSWER: D

5. Determine which of the following relations is a function with domain $\{1, 2, 3, 4\}$ ———

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

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

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

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

   ANSWER: C

6. Which of the following subsets forms a partition for $S = \{1, 2, 3, 4, 5, 6\}$ is ———

   A. $\{\{1, 3, 5\}, \{2, 4\}\}$

   B. $\{\{1, 3\}, \{3, 5\}, \{2, 4, 6\}\}$

   C. $\{\{1, 2, 3\}, \{4, 5\}, \{6\}\}$

   D. $\{\{1\}, \{1, 3, 5\}, \{2, 4, 6\}\}$

   ANSWER: C

7. If the relation R is defined on set of all integers as $R = \{(a, b)|ab \geq 0\}$ then R is

   A. reflexive and transitive

   B. symmetric and transitive

   C. transitive but not reflexive

   D. reflexive and symmetric

   ANSWER: D

8. Let $R = \{(1, 1), (1, 3), (3, 2), (3, 4), (4, 2)\}$ and $S = \{(2, 1), (1, 3), (3, 4), (4, 1)\}$ then $R \bullet S$ is

   A. $\{(1, 3), (1, 4), (3, 1)\}$

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

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

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

ANSWER: B

9. If M_R and M_S be the matrix representation of a relation R and S then $M_{R\oplus S}$ is ———

   A. $M_R + M_S$

   B. $M_{R\cup S}$

   C. $M_{R\cap S}$

   D. $M_{R\cup S} - M_{R\cap S}$

   ANSWER: D

10. If $A = \{1,2,3\}, B = \{w,x,y,z\}$ and $f : A \to B$ then how many functions of f are there ———

    A. 4

    B. 8

    C. 16

    D. 64

    ANSWER: D

11. If the function $f : A \to B$ is invertible then f is ————

    A. one to one

    B. onto

    C. bijective

    D. many to one

    ANSWER: C

12. Equivalence class of $'a'$ under the relation R is defined as

A. $\{x|(a,x) \in R\}$

B. $\{x|(x,a) \in R\}$

C. $\{a|(a,x) \in R\}$

D. $\{a|(x,a) \in R\}$

ANSWER: A

13. If $f : R \to R$ is given by $f(x) = x^3 - 2$ then f^{-1} is ———

A. $(x-2)^3$

B. $(x-2)^{\frac{1}{3}}$

C. $(x^3+2)^{\frac{1}{3}}$

D. $(x+2)^{\frac{1}{3}}$

ANSWER: D

14. If $S = \{1,2,3,4,5\}$ and the function $f : S \to S$ is given by $f = \{(1,2),(2,1),(3,4),(4,5),(5,3)\}$ then f^{-1} is

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

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

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

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

ANSWER: A

15. If $f : A \to B$ and $g : B \to A$ then $g \circ f$ is

A. I_A

B. many one

C. I_B

D. does not exist

ANSWER: A

16. In the generalization of a Pigeohole principle if the n pigeons are accomodated in 'm' holes then ————-

    A. $n \leq m$

    B. $n \geq m$

    C. $n < m$

    D. $n > m$

    ANSWER: D

17. The dual of $A = (\bar{B} \cap A) \cup (A \cap B)$

    A. $A = (\bar{B} \cup A)$

    B. $A = (A \cap B)$

    C. $A = (\bar{B} \cup A) \cap (A \cup B)$

    D. $A = \phi$

    ANSWER: C

18. If A is the universal set with n elements and $B_1, B_2, \cdots, B_m$ be the subsets of A then the number of minsets generated by $B_1, B_2, \cdots, B_m$ is ————-

    A. n

    B. 2^m

    C. 2^n

    D. m

    ANSWER: B