Mathematics Assignment 2(1)

Class XI

Chapter 2– Relations and Functions

Multiple Choice Questions

1. The universal relation A x A on A is

A. an equivalence relation

B. anti-symmetric

C. a partial ordering relation

D. not symmetric and not anti-symmetric

2. "n/m" means that n is a factor of m, then the relation T is

A. reflexive and symmetric

B. transitive and symmetric

C. reflexive, transitive and symmetric

D. reflexive, transitive and not symmetric

3. If the binary operation * is defined on a set of ordered pairs of real numbers as (a, b) * (c, d) = (ad + bc, bd) and is associative, then (1, 2) * (3, 5) * (3, 4) equals

A. (74,40)

B. (32,40)

C. (23,11)

D. (7,11)

4. If A = (1, 2, 3, 4). Let ~= {(1, 2), (1, 3), (4, 2)}. Then ~ is

A. not anti-symmetric

B. transitive

C. reflexive

D. symmetric

5. Which of the following set (s) are empty ?

A. $\{x : x = x\}$

B. $\{x : x \neq x\}$

C. $\{x : x = x^2\}$

D. $\{x : x \neq x^2\}$

6. Consider the following relations :

R1 (a, b) iff (a + b) is even over the set of integers
R2 (a, b) iff (a + b) is odd over the set of integers.
R3 (a, b) ifa.b > 0 over the set of non zero rational numbers.
R4 (a, b) if I a - b I < = 2 over the set of natural numbers.
Which of the following statements is correct ?

A. R1 and R2 are equivalence relations, R3 and R4 are not

B. R1 and R3 are equivalence relations, R2 and R4 are not

C. R1 and R4 are equivalence relations, R2 and R3 are not

D. R1, R2, R3 and R4 are all equivalence relations

7. A relation on the integers 0 through 4 is defined by : R = {(x, y) : x + y ≤ 2x). Which of the properties listed below applies to this relation?

I. Transitivity
II. Symmetry
III. Reflexivity

A. I only

B. III only

C. I and III

D. II and III

8. A relation over the set S = {x, y, z} is defined by : {(x, x), (x, y), (y, x), (x, z), (y, z), (y, y), (z, z)}. What properties hold for this relation?

A. Symmetric

B. Reflexive

C. Antisymmetric

D. Anti reflexive

9. The number of equivalence relations of the set (1, 2, 3, 4) is

A. 4

B. 15

C. 16

D. 24

10. Let x and y are sets and I x I and l y I are their respective cardinalities. It is given that there are exactly 97 functions from x to y. From this one can conclude that

A. $|x| = 1, |y| = 97$

B. $|x| = 97, |y| = 1$

C. $|x| = 97, |y| = 97$

D. none of these

11. If the binary operation * is defined on a set of ordered pairs of real numbers as (a, b) * (c, d) = (ad + bc, bd) and is associative, then
(1, 2) * (3, 5) * (3, 4) equals

A. (74,40)

B. (32,40)

C. (23,11)

D. (7,11)

12. Which of the following statements is false ?

A. If R is reflexive, then $R \cap R^{-1} \neq \varphi$

B. $R \cap R^{-1} \neq \varphi \Rightarrow$ R is anti-symmetric.

C. If R, R' are equivalence relations in a set A, then $R \cap R'$ is also an equivalence relation in A.

D. If R, R' are reflexive relations in A, then R - R' is reflexive

13. If R = {(1, 2),(2, 3),(3, 3)} be a relation defined on A= {1, 2, 3} then R . R(= R2) is

A. R itself

B. {(1, 2),(1, 3),(3, 3)}

C. {(1, 3),(2, 3),(3, 3)}

D. {(2, 1),(1, 3),(2, 3)}

14. If A = {1, 2, 3} then relation S = {(1, 1), (2, 2)} is

A. symmetric only

B. anti-symmetric only

C. both symmetric and anti-symmetric

D. an equivalence relation

15. Which of the following statements is true?

A. Every equivalence relation is a partial-ordering relation.

B. Number of relations form A = {x, y, z} to B= {1, 2} is 64.

C. Empty relation φ is reflexive

D. Properties of a relation being symmetric and being ant-symmetric are negative of each other.

16. f(x)= {x+2 (x ≤ -1)

{ x2 (-1 ≤ x ≤1)

{2 - x (x ≥ 1)

Then value of f (-1.75) + f (0.5) + f (1.5) is

A. 0

B. 2

C. 1

D. -1

17. A relation R is defined on the set of positive integers as xRy. If 2x + y ≤ 5, the relation R is

A. reflexive

B. symmetric

C. transitive

D. None of these

18. Which of the following sets is a null set ?

I. X = {x | x= 9, 2x = 4 }

II. Y = {x | x= 2x.x ≠ 0 }

III. Z = { x | x-8 = 4 }

A. I and II only

B. I, II and III

C. I and III only

D. II and III only

19. A Relation R is defined on the set of integers as xRy if (x + y) is even. Which of the following statements is TRUE?

A. R is not an equivalence relation

B. R is an equivalence relation having one equivalence class

C. R is an equivalence relation having two equivalence classes

D. R is an equivalence relation having three equivalence classes

20. If R be a symmetric and transitvie relation on a set A, then

A. R is reflexive and hence an equivalence relation

B. R is reflexive and hence a partial order

C. R is not reflexive and hence not an equivalence relation

D. None of these

21. The number of binary relations on a set with n elements is , here n^2 is n square

A. n^2

B. 2^{n^2}

C. 2^n

D.None of these

22. If A is a finite set with n elements, then number of elements in the largest equivalence relation of A is

A. 1

B. n

C. n+1

D. n^2

23. If R is an equivalence relation on a set A, then R-1 is

A. reflexive

B. symmetric

C. transitive

D. all of these

24. If relation R is defined on N by R = ((a, b): a divides b; a, b ∈N). Then R is

A. reflexive

B. symmetric

C. transitive

D. none of these

25. Relation R is defined on the set N as f(a,b): a, b are both odd), is

A. reflexive

B. symmetric

C. transitive

D. none of these

ANSWER

1. A	**2. D**	**3. A**	**4. B**	**5. B**
6. B	**7. C**	**8. B**	**9. A**	**10. A**
11. A	**12. D**	**13. C**	**14. C**	**15. B**
16. C	**17. C**	**18. A**	**19. C**	**20. D**
21. B	**22. D**	**23. D**	**24. C**	**25. D**