



**ST. LAWRENCE HIGH SCHOOL**  
A JESUIT CHRISTIAN MINORITY INSTITUTION



**Solutions of worksheet-6**

**SUBJECT – MATHEMATICS**

**Pre-test**

Chapter: Relations and Functions

Class: XII

Topic: Relations

Date: 15.05.2020

Choose the correct option

(1 X 15= 15)

1. Let  $R$  be a relation on the set  $\mathbb{N}$  given by  $R = \{(a, b) : a = b - 2, b > 6\}$ . Then –

a)  $(2, 4) \in R$  , b)  $(3, 8) \in R$  , **c)  $(6, 8) \in R$**  , d)  $(8, 7) \in R$

2. Which of the following is not an equivalence relation on  $\mathbb{Z}$  ?

a)  $a R b \Leftrightarrow a + b$  is an even integer.

b)  $a R b \Leftrightarrow a - b$  is an even integer.

**c)  $a R b \Leftrightarrow a < b$**

d)  $a R b \Leftrightarrow a = b$

3.  $R$  is a relation on set  $\mathbb{Z}$ , given by  $(x, y) \in R \Leftrightarrow |x - y| \leq 1$ . Then,  $R$  is –

a) Reflexive and transitive

**b) Reflexive and symmetric**

c) Transitive and symmetric

d) An equivalence relation.

4. The relation  $R$  defined on a set  $A = \{1, 2, 3, 4, 5\}$  by  $R = \{(a, b) : |a^2 - b^2| < 16\}$ , is given by –

a)  $\{(1, 1), (2, 1), (3, 1), (4, 1), (2, 3)\}$

b)  $\{(2, 2), (3, 2), (4, 2), (2, 4)\}$

c)  $\{(3, 3), (4, 3), (5, 4), (3, 4)\}$

**d) None of these.**

5. Let  $R$  be a relation over the set of all straight lines in a plane such that  $l_1 R l_2 \Leftrightarrow l_1 \perp l_2$ , (where,  $l_1$  and  $l_2$  are any two straight lines) then  $R$  is -

- a) **Symmetric**
- b) Reflexive
- c) Transitive
- d) Equivalence.

6. If  $A = \{a, b, c\}$ , then the relation  $R = \{(b, c)\}$  on  $A$  is -

- a) Reflexive
- b) Symmetric
- c) **Transitive**
- d) Reflexive & Transitive .

7. Let  $A = \{1, 2, 3\}$ . Then, the number of relations containing  $(1, 2)$  and  $(1, 3)$  which are reflexive and symmetric but not transitive is -

- a) **1** , b) 2 , c) 3 , d) 4

8. The relation  $R$  in  $\mathbb{N} \times \mathbb{N}$  such that  $(a, b) R (c, d) \Leftrightarrow a + d = b + c$  is -

- a) Reflexive but not symmetric
- b) Reflexive and transitive but not symmetric
- c) **An equivalence relation**
- d) None of these.

9. If  $A = \{1, 2, 3\}$  &  $B = \{1, 4, 6, 9\}$  and  $R$  is a relation from  $A$  to  $B$  defined by " $x$  is greater than  $y$ ; where  $x$  is in  $A$  and  $y$  is in  $B$ ". The range of  $R$  is -

- a)  $\{1, 4, 6, 9\}$  ; b)  $\{4, 6, 9\}$  ; c)  **$\{1\}$**  ; d) None of these.

10. If  $A = \{2, 3, 4, 5\}$  &  $B = \{3, 6, 7, 10\}$  and  $R$  is a relation from  $A$  to  $B$  defined by " $x$  is relatively prime to  $y$ ; where  $x$  is in  $A$  and  $y$  is in  $B$ ". The domain of  $R$  is -

- a)  $\{2, 3, 5\}$  ; b)  $\{3, 5\}$  ; c)  $\{2, 3, 4\}$  ; d)  **$\{2, 3, 4, 5\}$**

11. A relation  $\Psi$  from  $\mathbb{C}$  to  $\mathbb{R}$  is defined by  $x R y \Leftrightarrow |x| = y$ . Which one is correct ?

- a)  $(2 + 3i) \Psi 13$  ; b)  $(3) \Psi (-3)$  ; c)  $(1 + i) \Psi (2)$  ; d)  **$(i) \Psi 1$**

12. Let  $R$  be a relation on  $\mathbb{N}$  defined by  $x + 2y = 8$ . The domain of  $R$  is -

- a)  $\{2, 4, 8\}$  ; b)  $\{2, 4, 6, 8\}$  ; c)  $\{2, 4, 6\}$  ; d)  $\{1, 2, 3, 4\}$

13.  $R$  is a relation from  $\{11, 12, 13\}$  to  $\{8, 10, 12\}$  defined by  $x R y \Leftrightarrow y = x - 3$ . Then  $R^{-1}$  is -

- a)  $\{(8, 11), (10, 13)\}$   
b)  $\{(11, 8), (13, 10)\}$   
c)  $\{(10, 13), (8, 11), (8, 10)\}$   
d) None of these.

14. Let  $R = \{(a, a), (b, b), (c, c), (a, b)\}$  be a relation on a set  $A = \{a, b, c\}$ . Then,  $R$  is-

- a) Transitive ; b) Reflexive ; c) Symmetric ; d) None of these.

15. Let  $R = \{(a, b), (b, c), (a, c)\}$  be a relation on a set  $A = \{a, b, c\}$ . Then,  $R$  is-

- a) Neither reflexive nor transitive  
b) Neither symmetric nor transitive  
c) Transitive  
d) None of these.

Prepared by :-  
SUKUMAR MANDAL (SkM).