



RK VISION ACADEMY

NEET | IIT – JEE | FOUNDATION

CBSE PRACTICE PAPER(2024)

(Mathematics)

Grade : XII

marks

Chapter: Probability Set-1

minutes

Marks: 40

Time: 90

SECTION A

(This section comprises of Multiple-choice questions (MCQ) of 1 mark each.)

- The maximum number of equivalence relations on the set $A = \{1, 2, 3\}$ are
(A) 1 (B) 2 (C) 3 (D) 5
- Let T be the set of all triangles in the Euclidean plane, and let a relation R on T be defined as aRb if a is congruent to $b \forall a, b \in T$. Then R is
(A) reflexive but not transitive (B) transitive but not symmetric (C) equivalence (D) none of these
- Which of the following functions from Z into Z are bijections?
(A) $f(x) = x^3$ (B) $f(x) = x + 2$ (C) $f(x) = 2x + 1$ (D) $f(x) = x^2 + 1$
- If a relation R on the set $\{1, 2, 3\}$ be defined by $R = \{(1, 2)\}$, then R is
(A) reflexive (B) transitive (C) symmetric (D) none of these
- Let T be the set of all triangles in the Euclidean plane, and let a relation R on T be defined as aRb if a is congruent to $b \forall a, b \in T$. Then R is
(A) reflexive but not transitive (B) transitive but not symmetric (C) equivalence (D) none of these
- Let $A = \{1, 2, 3\}$ and consider the relation $R = \{(1, 1), (2, 2), (3, 3), (1, 2), (2, 3), (1,3)\}$. Then R is
(A) reflexive but not symmetric (B) reflexive but not transitive (C) symmetric and transitive (D) neither symmetric, nor transitive
- Let $f : A \rightarrow B$ and $g : B \rightarrow C$ be the bijective functions. Then $(g \circ f)^{-1}$ is
(A) $f^{-1} \circ g^{-1}$ (B) $f \circ g$ (C) $g^{-1} \circ f^{-1}$ (D) $g \circ f$
- If the set A contains 5 elements and the set B contains 6 elements, then the number of one-one and onto mappings from A to B is s
(A) 720 (B) 120 (C) 0 (D) none of these
- If a relation R on the set $\{1, 2, 3\}$ be defined by $R = \{(1, 2)\}$, then R is
(A) reflexive (B) transitive (C) symmetric (D) none of these
- Let $f : R \rightarrow R$ be defined by $f(x) = 1/x \forall x \in R$. Then f is
(A) one-one (B) onto (C) bijective (D) f is not defined

SECTION B

(This section comprises of very short answer type-questions (VSA) of 2 marks each.)

- Given that $N = \{1, 2, 3, \dots, 100\}$, then Write the subset B of N , whose element are represented by $x + 2$, where $x \in N$.
- Find the range of the following functions given by $\frac{|x - 4|}{x - 4}$
- Solve for x , $4x + 3 \geq 2x + 17$, $3x - 5 < -2$.

SECTION C

(This section comprises of short answer type questions (SA) of 3 marks each)

- 14 Let $f: \mathbb{R} \rightarrow \mathbb{R}$ be the function defined by $f(x) = 2x - 3, \forall x \in \mathbb{R}$. write f^{-1} .
- 15 If $f: \mathbb{R} \rightarrow \mathbb{R}$ is defined by $f(x) = x^2 - 3x + 2$, write $f(f(x))$.
- 16 Is $g = \{(1, 1), (2, 3), (3, 5), (4, 7)\}$ a function? If g is described by $g(x) = \alpha x + \beta$, then what value should be assigned to α and β .

SECTION D

(This section comprises of long answer-type questions (LA) of 5 marks each)

- 17 Let R be relation defined on the set of natural number \mathbb{N} as follows: $R = \{(x, y): x \in \mathbb{N}, y \in \mathbb{N}, 2x + y = 41\}$. Find the domain and range of the relation R . Also verify whether R is reflexive, symmetric and transitive.
- 18 Let $A = [-1, 1]$. Then, discuss whether the following functions defined on A are one-one, onto or bijective: (i) $f(x) = x/2$ (ii) $g(x) = |x|$ (iii) $h(x) = x|x|$ (iv) $k(x) = x^2$
- 19 A general election of Lok Sabha is a gigantic exercise. About 911 million people were eligible to vote and voter turnout was about 67%, the highest ever. Let I be the set of all citizens of India who were eligible to exercise their voting right in general election held in 2019. A relation ' R ' is defined on I as follows: $R = \{(V1, V2) : V1, V2 \in I \text{ and both use their voting right in general election - 2019}\}$
- Two neighbors X and $Y \in I$. X exercised his voting right while Y did not cast her vote in general election - 2019. Which of the following is true?
a. $(X, Y) \in R$ b. $(Y, X) \in R$ c. $(X, X) \notin R$ d. $(X, Y) \notin R$
 - Mr. ' X ' and his wife ' W ' both exercised their voting right in general election -2019, Which of the following is true?
a. both (X, W) and $(W, X) \in R$ b. $(X, W) \in R$ but $(W, X) \notin R$
c. both (X, W) and $(W, X) \notin R$ d. $(W, X) \in R$ but $(X, W) \notin R$
 - Three friends $F1, F2$ and $F3$ exercised their voting right in general election-2019, then which of the following is true?
a. $(F1, F2) \in R, (F2, F3) \in R$ and $(F1, F3) \in R$
b. $(F1, F2) \in R, (F2, F3) \in R$ and $(F1, F3) \notin R$
c. $(F1, F2) \in R, (F2, F2) \in R$ but $(F3, F3) \notin R$
d. $(F1, F2) \notin R, (F2, F3) \notin R$ and $(F1, F3) \notin R$
 - The above defined relation R is _____
a. Symmetric and transitive but not reflexive
b. Universal relation
c. Equivalence relation
d. Reflexive but not symmetric and transitive.