National Public School, Gorakhnath !

TOPIC : RELATIONS

D·P·P-(01)

CLASS-(XII)

(1) If $A=\{2,4\}$ and $B=\{3,4,5\}$, then find $(A\cap B)\times(A\cup B)$.

(2). If $A=\{1,2,3\}$ and $B=\{a,b\}$, then find $A\times B$ and $B\times A$. Does $A\times B = B\times A$ holds true ?

(3). If $P=\{1,2\}$, then find $P\times P\times P$?

(4). If $n(A)=7$, $n(B)=8$ and $n(A\cap B)=4$, then match the following Columns given as !

(i). $n(A\cup B)$	(a). 56
(ii). $n(A\times B)$	(b). 16
(iii). $n((A\times B)\times A)$	(c). 392
(iv). $n((A\times B)\cap(B\times A))$	(d). 96
(v). $n((A\times B)\cup(B\times A))$	(e). 11

(5). If $A=\{1,2,3,4,5\}$ and $B=\{2,4,5\}$ then relation R defined from A to B as $R=\{(a,b):$ a and b are relatively prime or Co-prime, for $a\in A$ and $b\in B\}$.

(i). Find the Domain and Range of R and Codomain of R ?

(ii). Is relation $R = R^{-1}$?

(6). If $A=\{1,3,5,7\}$, $B=\{2,4,6,8\}$, then relation R defined from A to B as $aRb \Leftrightarrow a>b$, for $a\in A, b\in B$.

Find the Domain, Range and Codomain of relation R ?

(7). If $A=\{1,2,3,4,5\}$, then, Identify which of the following are Empty Relation(s) defined on A ?

(i). $R_1=\{(x,y): xy\neq 25$ for $x,y\in A\}$

(ii). $R_2=\{(x,y): xy>1$ for $x,y\in A\}$

(iii). $R_3=\{(x,y): x+y>0$, for $x,y\in A\}$

(iv). $R_4=\{(x,y): |x-y|>1$, for $x,y\in A\}$

(v). $R_5=\{(x,y): xy>25$ for $x,y\in A\}$

). If $A=\{1,2,3\}$ then answer the following as !-

i). Total no. of Possible relations that can be defined on A ?

ii). Number of Empty Relation and Universal Relation on A ?

iii). Number of Relation on A which are neither the Smallest nor the Largest Relation defined on A ?

). Give example of any Relation which is Empty Relation on A in Set Builder Form ?

). Give example of Universal Relation on A in Set Builder form ?

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(TOPIC): [RELATIONS]

D.P.P - (01) CLASS (XII)

(9). If $A = \{1, 2, 3\}$, then

(i). Determine I_A ? (ii) Find $n(I_A)$ i.e. Cardinality of Identity Relation on A ?

(iii). Is Relation R on A given as $R = \{(1,1), (2,2)\}$ an Identity Relation on A ? Justify with reasons

(iv) Is Relation R on A given as $R = \{(1,1)\ (2,2), (3,3), (1,2), (3, ...$ an Identity Relation on A ? Justify with reasons.

(10) (i) Does the relation " ~~is~~ a is brother of b" an Identity Relation or Reflexive Relative ?

(ii). Does the ~~relation~~ ~~"~~ Equality Relation an Identity Relation and Reflexive Relation defined on N, W, Z, Q, T, R, ...

(iii). Does the relation " ~~par~~ line l_1 parallel to l_2" represents Reflexive Relation on the set of all straight lines in a Plane ...

(11). Determine the smallest Equivalence Relation on the set $A = \{5, 6, 7, ...$

(12). Determine the smallest Reflexive Relation on the set $A = \{1, 2, 3, 4 ...$ Also, determine the Largest Reflexive Relation defined on set A ...

(13). From above questions (12) & (13), also determine the Largest Possible Relation defined on set $A = \{1, 2, 3, 4\}$ or $B = \{5, 6, 7, 8\}$ which is Symmetric ??

(14). Does the Relations "equal to (=)"; "is greater than (>)"; "is less than (<)"; "not greater than ($\not>$)"; "(not smaller than ($\not<$))"; "Similarity between Triangles"; represents Reflexivity, Symmetric and Transitivity Nature in a Relation ?

(15). Test whether the following relations R_1, R_2 and R_3 are (i). Reflexive (ii). Symmetric (iii) Transitive given as :-

...) R_1 on Q_0 defined by $(a,b) \in R_1 \Leftrightarrow a = \frac{1}{b}$, $\forall\, a, b \in R_0$?

...). R_2 on Z defined by $(a,b) \in R_2 \Leftrightarrow |a-b| \leq 5$ or $|a-b| \not> 5$, $\forall\, a, b \in Z$?

...). R_3 on R defined by $(a,b) \in R_3 \Leftrightarrow a^2 - 4ab + 3b^2 = 0$, $\forall\, a, b \in R$?

... Let A be the set of all human beings in a Town at a particular ...me. Determine whether each of the following relations are ...flexive, Symmetric and Transitive given as :-

... $R = \{(x, y) : x$ is wife of $y\}$. (b). $R = \{(x, y) : x$ is Father of $y\}$.

... $R = \{(x, y) : x$ is Cousin of $y\}$ (d) $R = \{(x, y) : x$ is Mother of $y\}$.