

http://www.trbtnpsc.com/2018/06/latest-plus-one-11th-study-materials-tamil-medium-english-medium-new-syllabus-based.html

9. The number of relations on a set containing 3 elements is

a) 9

- b) 81
- c) 512
- d) 1021

10. The number of constant functions from a set containing m elements to a set containing n elements is

a) mnb) m+n c) m d) n

II. Answer any five of the following Questions $5x^2 = 10$

Question Number 16 is comulsary

- 11. Find the number of subsets of A if $A = \{x : x = 4n + 1, 2 \le n \le 5, n \in N\}$.
- 12. Let f and g be the two functions from R to R defined by f(x) = 3x 4 and $g(x) = x^2 + 3$. Find $g \circ f$ and $f \circ g$.
- 13. If P(A) denotes the power set of A, then find $n(P(P(\emptyset))))$.
- 14. If $n(A \cap B) = 3$ and $n(A \cup B) = 10$, then find $n(P(A \Delta B))$.
- 15. For a set A,A× A contains 16 elements and two of its elements are (1, 3) and (0,2). Find the elements of A.
- 16. Let f, g : R \rightarrow R be defined as f(x) = 2x |x| and g(x) = 2x + |x|. Find f \circ g.

III. Answer any five of the following Questions 5x3 = 15

Question Number 22 is comulsary

- 17. Prove that(($A \cup B^{I} \cup C$) \cap ($A \cap B^{I} \cap C^{I}$)) \cup (($A \cup B \cup C^{I}$) \cap ($B^{I} \cap C^{I}$)) = $B^{I} \cap C^{I}$
- 18. If $X = \{1, 2, 3, ..., 10\}$ and $A = \{1, 2, 3, 4, 5\}$, find the number of sets $B \subseteq X$ such that $A - B = \{4\}$.
- 19. Find the range of the function $f(x) = \frac{1}{1-3\cos x}$.
- 20. Let A and B be two sets such that n(A) = 3 and n(B) = 2. If (x, 1), (y, 2), (z, 1) are inA × B,findA and B, where x, y, z are distinct elements.
- 21. Check whether the function f(x) = x|x| defined on [-2, 2] is one-to-one or not. If it is one-to-one, find a suitable co-domain so that the function becomes a bijection.
- 22. If $f : R \rightarrow R$ is defined by f(x) = 2x 3 prove that f is a bijection and find its inverse.

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IV. Answer any three of the following Questions3x5 = 15Question Number 28 is comulsary

- 23. In a survey of 5000 persons in a town, it was found that 45% of the persons know Language A, 25% know Language B, 10% know Language C, 5% know Languages A and B, 4% know Languages B and C, and 4% know Languages A and C. If 3% of the persons know all the three Languages, find the number of persons who knows only Language A.
- 24. If A and B are two sets so that $n(B A) = 2n(A B) = 4n(A \cap B)$ and if $n(A \cup B) = 14$, then find n(P(A)).
- 25. If A × A has 16 elements, $S = \{(a, b) \in A \times A : a < b\}; (-1, 2) \text{ and } (0, 1)$ are two elements of S, then find the remaining elements of S.
- 26. On the set of natural numbers let R be the relation defined by aRbif $a + b \le 6$.Write down therelation by listing all the pairs. Check whether it is
- (i) reflexive (iii) transitive
- (ii) symmetric (iv) equivalence.
- 27. In the set Z of integers, define mRnif m n is divisible by 7. Prove that R is an equivalencerelation.
- 28. Find the largest possible domain for the real valued function given by $f(x) = \frac{\sqrt{9-x^2}}{\sqrt{x^2-1}}$

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