PERSONAL PAPER

PANDEYPUR

QUESTION BANK

Class 11 - Mathematics

1. For any set A, (A')' is equal to **[1]**

   a) ϕ b) None of these

   c) A d) A'

2. If A = {1, 2, 3, 4, 5, 6} then the number of proper subsets is **[1]**

   a) 63 b) 36

   c) 64 d) 25

3. If A = {1, 3, 5, B} and B = {2, 4}, then **[1]**

   a) {4} $\subset$ A b) None of these

   c) B $\subset$ A d) 4 $\in$ A

4. If Q = {x : x = $\frac{1}{y}$, where y $\in$ N}, then **[1]**

   a) 1 $\in$ Q b) $\frac{1}{2} \notin$ Q

   c) 2 $\in$ Q d) 0 $\in$ Q

5. If A $\cap$ B = B then **[1]**

   a) A = ϕ b) B = ϕ

   c) none of these d) B $\subseteq$ A

6. For two sets A $\cup$ B = A if **[1]**

   a) A = B b) A $\neq$ B

   c) B $\subseteq$ A d) A $\subseteq$ B

7. If A, B, C be any three sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then **[1]**

   a) B = C b) A = B = C

   c) A = C d) A = B

8. Which set is the subset of all given sets? **[1]**

   a) {1} b) {0}

   c) {1, 2, 3, 4} d) { }

9. The set A = {x : x is a positive prime number less than 10} in the tabular form is **[1]**

   a) {2, 3, 5, 7} b) {1, 2, 3, 5, 7}

   c) none of these d) {1, 3, 5, 7, 9}

10. If A = {0, 1, 5, 4, 7}. Then the total number subsets of A are **[1]**

a) 20 b) 32

c) 64 d) 40

11. For any two sets A and B, A ∩ (A ∪ B)' is equal to **[1]**

a) A ∩ B b) ϕ

c) B d) A

12. Which of the following is a null set? **[1]**

a) C = ϕ b) B = {x : x + 3 = 3}

c) D = {0} d) A = {x : x > 1 and x < 1}

13. Which of the following is a set? **[1]**

A. A collection of vowels in English alphabets is a set.

B. The collection of most talented writers of India is a set.

C. The collection of most difficult topics in Mathematics is a set.

D. The collection of good cricket players of India is a set.

a) B b) D

c) A d) C

14. The number of non-empty subsets of the set {1, 2, 3, 4} is: **[1]**

a) 14 b) 16

c) 17 d) 15

15. If aN = {ax : x ∈ N}, then the set 3N ∩ 7N is **[1]**

a) 10N b) 7N

c) 21N d) 4N

16. For any two sets A and B, $A \cap (A \cup B) = \ldots.$ **[1]**

a) A b) ϕ

c) none of these d) B

17. If $A \cup B = B$ then **[1]**

a) $B \subset A$ b) $A \subseteq B$

c) B = ϕ d) A $\neq \phi$

18. Two finite sets have m and n elements. The total number of subsets of the first set is 56 more than the total number of subsets of the second set. The values of m and n are **[1]**

a) 7, 4 b) 6, 4

c) 3, 3 d) 6, 3

19. The number of proper subsets of the set {1, 2, 3} is : **[1]**

a) 6 b) 7

c) 8 d) 5

20. If A and B are two sets then $A \cap (A \cap B')$ = ... **[1]**

a) $\in$ b) A

c) ϕ d) B

21. The Given statement is true or false: {a, e, i, o, u) and {a, b, c, d} are disjoint sets. **[1]**

22. Write the set F = {The set of all letters in the word 'BETTER' } in roster form. **[1]**

23. Consider the sets ϕ, A = {1, 3}, B = {1, 5, 9}, C = {1, 3, 5, 7, 9}. Insert the symbol $\subset$ *or* $\not\subset$ between the pair of set: ϕ . . . B **[1]**

24. List element of the given set: B = {x : x is an integer, -1 / 2 < x < 9/ 2} **[1]**

25. List the element of the set: E = {x : x is a month of a year not having 31 days} **[1]**

26. Let A and B be any two sets. Using properties of sets prove that: (A - B) $\cap$ B = ϕ. **[1]**

27. State whether A = B or not if set A = {x : x is a multiple of 10} and set B = {10, 15, 20, 25, 30, . . .} **[1]**

28. If A = {x : x $\in$ N}, B = {x : x $\in$ N and x is even}, C = {x : x $\in$ N and x is odd} and D = { x : x $\in$ N and x is prime} then find: B $\cap$ C **[1]**

29. Write the set in the set-builder form: {1, 4, 9, . . ., 100} **[1]**

30. Let A = {a, b, c}, B = {b, c, d, e} and C = {c, d, e, f} be subsets of C = {c, d, e, f} be subsets of U = {a, b, c, d, e, f}. Then, verify that: (A')' = A **[1]**

31. Is it set? Justify your answer: The collection of prime integers. **[1]**

32. List element of the given set: F = {x : x is a consonant in the English alphabet which precedes K} **[1]**

33. State whether A $\subset$ B or A $\not\subset$ B: A = ϕ, B = {0} **[1]**

34. Show that {0} and ϕ are not equivalent sets. **[1]**

35. Express the set as an interval: E = {x : x $\in$ R, -3 $\leq$ x < 2} **[1]**

36. Write down all possible subsets of A = {4}. **[1]**

37. If A = {1, 2, 3, 4, 5}, B = {4, 5, 6, 7, 8}, C = {7, 8, 9, 10, 11} and D = {10, 11, 12, 13, 14}, find: (A $\cup$ C) $\cap$ (C $\cup$ D) **[1]**

38. If A = {1, 2, 3, 4} and B = {3, 4, 5, 6} find: $A \cup B$ **[1]**

39. Determine whether the statement is true or false. If it is true, prove it. If it is false, give an example: If $A \not\subset C$ and $B \not\subset C$ then $A \not\subset C$ **[1]**

40. Let A = {a, b}, B = {a, b, c}. Is A $\subset$ B? What is A $\cup$ B? **[1]**

41. Decide among the following sets which sets are subsets of each another: **[2]**

A = {x : x $\in$ R and x satisfies x^2 - 8x + 12 = 0}, B = {2, 4, 6}, C = {2, 4, 6, 8, ...}, D = {6}

42. Write the subsets of R as intervals: {x : x $\in$ R, 0 $\leq$ x $\leq$ 7} Also, find the length of interval. **[2]**

43. Are the G = {-1, 1} and H = {x : x $\in$ Z, x^2 - 1 = 0} pairs of equal sets? **[2]**

44. Let A = {x : x $\in$ N), B = (x : x = 2n, n $\in$ N}, C = {x : x = 2n - 1, n $\in$ N} and, D = {x : x is a prime natural number}. Find: B $\cap$ D. **[2]**

45. Prove that $(A \cap B')' \cup (B \cap C) = A' \cup B$. **[2]**

46. Is it set? Justify your answer: **[2]**

A collection of all the months of the year whose name begins with the letter M.

47. What is the difference between a collection and a set? Give reasons to support your answer? **[2]**

48. Is A = {x : x $\in$ N, 1 < x $\leq$ 2} null set? **[2]**

49. Show that for any sets A and B, A = (A $\cap$ B) $\cap$ (A - B). **[2]**

50. If A = {(x, y) : y = e^x, x $\in$ R} and B = {(x, y) : y = e^{-x}, x $\in$ R}, then write A $\cap$ B. **[2]**

51. Write the set in the roster form: D= {t|t^3 = t, t $\in$ R} **[2]**

52. Find AΔB, if A = {1, 3, 4} and B = {2, 5, 9, 11}. **[2]**

53. State whether A = {x : x is a letter in the word LOYAL} and B = {x: x is a letter of the word ALLOY} are equal? Justify your answer. **[2]**

54. Use the properties of sets to prove that for all the sets A and B **[2]**

A – (A ∩ B) = A – B

55. Let A = {x : x ∈ N, x^2 - 9 = 0}and B = {x : x ∈ Z, x^2 - 9 = 0}. Show that A ≠ B. **[2]**

56. For any two sets of A and B, prove that: A' ∪ B = U ⇒ A ⊂ B. **[2]**

57. If A = {a, b, c, d, e}, B = {a, c, e, g} and C = {b, e, f, g}, verify that: (A ∪ B) ∪ C = A ∪ (B ∪ C) **[2]**

58. Write the interval in set builder form: (-3,0) **[2]**

59. Is B = {x : x^2 + 2x + 1 = 0, x ∈ N} a singleton set? **[2]**

60. List all the element of the set: F = {x : x ∈ Z and $-\frac{1}{2}$ < x < $\frac{13}{2}$} **[2]**

61. Find the symmetric difference AΔB, when A = {1, 2, 3} and B = {3, 4, 5} **[3]**

62. Are the E = {x : x ∈ Z, $x^2 \leq 4$} and F = {x : x ∈ Z, x^2 = 4} pairs of equal set? **[3]**

63. Let A and B be two sets. If $A \cap X = B \cap X = \phi$ and $A \cup X = B \cup X$ for some set X, prove that A = B. **[3]**

64. Let A, B and C be the sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$. Show that B = C. **[3]**

65. If A and B are sets, then prove that A - B, A ∩ B and B - A are pair wise disjoint. **[3]**

66. Let A, B and C be sets. Then show that **[3]**

A ∪ (B ∩ C) = (A ∪ B) ∩ (A ∪ C)

67. Let A = {2, 3, 5, 7, 11, 13} and B = {5, 7, 9, 11, 15} be subsets of U = {2, 3, 5, 7, 9, 11, 13, 15}. **[3]**

Using Venn diagrams, verify that: (A ∪ B') ≠ (A' ∩ B')

68. If A = {3, 6, 9, 12, 15, 18, 21}, B = {4, 8, 12,16, 20}, C = {2, 4, 6, 8, 10, 12, 14, 16}, D = {5, 10, 15, 20}, find: **[3]**

A - B?

69. If U = {2, 3, 4, 5, 6, 7, 8, 9, 10, 11}, A = {2, 4, 7}, B = {3, 5, 7, 9, 11} and C = {7, 8, 9, 10, 11}, then compute **[3]**

i. $(A \cap U) \cap (B \cup C)$

ii. C - B

iii. B - C

iv. (B - C)'

70. For any two sets A and B, prove that $A \cup B = A \cap B \Leftrightarrow A = B$. **[3]**

71. Draw appropriate Venn diagram for: (A ∪ B) **[3]**

72. From the sets given below, select equal sets and equivalent sets: **[3]**

A = {0, a}, B = {1, 2, 3, 4}, C = {4, 8, 12}, D = {3 ,1, 2, 4},.....

E = {1, 0}, F = {8, 4, 12}, G = {1, 5, 7, 11}, H = {a, b}.

73. For sets A and B, show that: $P(A \cap B) = P(A) \cap P(B)$ **[3]**

74. Which of the following sets are equal ? **[3]**

i. A = {1, 2, 3}

ii. B = {x ∈ R : x^2 -2x + 1= 0}

iii. C = {1, 2, 2, 3}

iv. D = {x ∈ R : x^3 - $6x^2$ + 11x - 6 =0}

75. The Given 'Set' is null or not? Set of odd natural numbers divisible by 2. **[3]**