MATHS

BOOKS - PSEB

SETS

Exercise

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1. Which of the following are sets ? Justify your answer. The collection of all the months of a year beginning with the letter J.

2. Which of the following are sets ? Justify your answer. The collection of ten most talented writers of India.

3. Which of the following are sets ? Justify your answer. A team of eleven best-cricket batsmen of the world.

4. Which of the following are sets ? Justify your answer. The collection of all boys in your class.

5. Which of the following are sets ? Justify your answer. The collection of all natural numbers less than 100.

6. Which of the following are sets ? Justify your answer. A collection of novels written by the writer Munshi Prem Chand.

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7. Which of the following are sets ? Justify your answer. The collection of all even integers.

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8. Which of the following are sets ? Justify your answer. The collection of questions in this Chapter.

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9. Which of the following are sets ? Justify your answer. A collection of most dangerous animals of the world.

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10. Let A = {1, 2, 3, 4, 5, 6}. Insert the appropriate symbol $\in$ or $\notin$ in the blank space: 5. . .A

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11. Let A = {1, 2, 3, 4, 5, 7}. Insert the appropriate symbol $\in$ or $\notin$ in the blank space: 8 ...A

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12. Let A = {1, 2, 3, 4, 5, 8}. Insert the appropriate symbol $\in$ or $\notin$ in the blank space: 0. . .A

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13. Let A = {1, 2, 3, 4, 5, 9}. Insert the appropriate symbol $\in$ or $\notin$ in the blank space: 4. . . A

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14. Let A = {1, 2, 3, 4, 5, 10}. Insert the appropriate symbol $\in$ or $\notin$ in the blank space: 2. . .A

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15. Let A = {1, 2, 3, 4, 5, 11}. Insert the appropriate symbol $\in$ or $\notin$ in the blank space: 10. . .A

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16. Write the following set in roster form: A = {x : x is an integer and -3 < x < 7}

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17. Write the following set in roster form: B = {x : x is a natural number less than 6}

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18. Write the following set in roster form: C = {x : x is a two-digit natural number such that the sum of its digits is 8}

19. Write the following set in roster form: D = {x : x is a prime number which is divisor of 60}

20. Write the following set in roster form: E = The set of all letters in the word TRIGONOMETRY

21. Write the following set in roster form: F = The set of all letters in the word BETTER

22. Write the following set in the set-builder form : {3,6,9,12}

23. Write the following set in the set-builder form : {2,4,8,16,32}

24. Write the following set in the set-builder form : {5,25,125,625}

25. Write the following set in the set-builder form : {2,4,6....}

26. Write the following set in the set-builder form : {1,4,9,...,100}

27. List all the elements of the following set : A = {x : x is an odd natural number}

28. List all the elements of the following set : B $= \{x : x$ is an integer, $-\dfrac{1}{2} < x < \dfrac{9}{2}\}$

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29. List all the elements of the following set : C $= \{x : x$ is an integer, $x^2 \leq 4\}$

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30. List all the elements of the following set : D

= {x : x is a letter in the word "LOYAL"}

31. List all the elements of the following set : E

= {x : x is a month of a year not having 31 days}

32. List all the elements of the following set : F = {x : x is a consonant in the English alphabet which precedes k }.

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33. Which of the following are examples of the null set :- Set of odd natural numbers divisible by 2

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34. Which of the following are examples of the null set :- Set of even prime numbers

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35. Which of the following are examples of the null set :- { x : x is a natural numbers, x < 5 and x > 7 }

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36. Which of the following are examples of the null set :- { y :y is a point common to any two parallel lines}

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37. Which of the following sets are finite or infinite:- The set of months of a year

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38. Which of the following sets are finite or infinite:- {1,2,3....}

39. Which of the following sets are finite or infinite:- {1,2, 3,...99, 100}

40. Which of the following sets are finite or infinite:- The set of positive integers greater than 100

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41. Which of the following sets are finite or infinite:- The set of prime numbers less than 99

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42. State whether each of the following set is finite or infinite: The set of lines which are parallel to the x-axis

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43. State whether each of the following set is finite or infinite: The set of letters in the English alphabet

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44. State whether each of the following set is finite or infinite: The set of numbers which are multiple of 5

45. State whether each of the following set is finite or infinite: The set of animals living on the earth

46. State whether each of the following set is finite or infinite: The set of circles passing through the origin (0,0)

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47. In the following, state whether A = B or not:

A= {a,b, c,d} B = { d, c, b,a }

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48. In the following, state whether A = B or not: A = { 4, 8, 12, 16 } B = {8,4, 16,18}

49. In the following, state whether A = B or not: A ={2.4, 6, 8, 10} B = { x : x is positive even integer and $x \leq 10$}

50. In the following, state whether A = B or not: A = { x : x is a multiple of 10}, B = { 10, 15,20,25,30, . . . }

51. Are the following pair of sets equal ? Give reasons. A={2, 3}, B= {x : x is solution of x^2 + 5x + 6 = 0}

52. Are the following pair of sets equal ? Give reasons. A = { x : x is a letter in the word FOLLOW} B = { y : y is a letter in the word WOLF}

53. From the sets given below, select equal sets : A = { 2, 4, 8, 12}, B = { 1, 2, 3, 4}, C = { 4, 8, 12, 14}, D = { 3, 1,4,2} E={-1,1}, F = { 0, a}, G= {1,-1}, H = { 0, 1}

54. Make correct statements by filling in the symbols $\subset$ or $\not\subset$ in the blank spaces : { 2, 3, 4 } . . . { 1, 2, 3, 4,5 }

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55. Make correct statements by filling in the symbols $\subset$ or $\not\subset$ in the blank spaces : { a, b, c } . . . { b, c, d }

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56. Make correct statements by filling in the symbols $\subset$ or $\not\subset$ in the blank spaces : {x : x is a student of Class XI of your school). . .{x : x student of your school)

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57. Make correct statements by filling in the symbols $\subset$ or $\not\subset$ in the blank spaces : {x : x is a circle in the plane) . . .{x : x is a circle in the same plane with radius 1 unit)

58. Make correct statements by filling in the symbols ⊂ or ⊄ in the blank spaces : {x : x is a triangle in a plane) . . . {x : x is a rectangle in the plane)

59. Make correct statements by filling in the symbols ⊂ or ⊄ in the blank spaces : {x : x

is an equilateral triangle in a plane) ... {x : x is a triangle in the same plane)

60. Make correct statements by filling in the symbols $\subset$ or $\not\subset$ in the blank spaces : {x : x is an even natural number) ... {x : x is an integer)

61. Examine whether the following statement is true or false: { a, b } $\not\subset$ { b, c, a }

62. Examine whether the following statement is true or false: {a,e) $\subset$ {x:xisa vowel in the English alphabet)

63. Examine whether the following statement is true or false: $\{ 1,2,3 \} \subset \{ 1,3, 5\}$

64. Examine whether the following statement is true or false: $\{ a \} \subset \{ a, b. c \}$

65. Examine whether the following statement is true or false: $\{ a \} \in \{ a, b, c \}$

66. Examine whether the following statement is true or false: { x : x is an even natural number less than 6) $\subset$ { x : x is a natural number which divides 36}

67. Let A = { 1, 2, { 3, 4 }. 5 }. Which of the following statements are incorrect and why?

$\{3, 4\} \subset A$

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68. Let A = { 1, 2, { 3, 4 }. 6 }. Which of the following statements are incorrect and why?

$\{3, 4\} \in A$

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69. Let A = { 1, 2, { 3, 4 }. 7 }. Which of the following statements are incorrect and why?

{{3,4}} ⊂ A

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70. Let A = { 1, 2, { 3, 4 }. 8 }. Which of the following statements are incorrect and why? 1

∈ A

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71. Let A = { 1, 2, { 3, 4 }. 9 }. Which of the following statements are incorrect and why? 1 ⊂ A

72. Let A = { 1, 2, { 3, 4 }. 10 }. Which of the following statements are incorrect and why? {1, 2, 5} ⊂ A

73. Let A = { 1, 2, { 3, 4 }. 11 }. Which of the following statements are incorrect and why?

{1, 2, 5} ∈ A

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74. Let A = { 1, 2, { 3, 4 }. 12 }. Which of the following statements are incorrect and why?

{1, 2, 3} ⊂ A

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75. Let A = { 1, 2, { 3, 4 }. 13 }. Which of the following statements are incorrect and why?

$\phi \in$ A

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76. Let A = { 1, 2, { 3, 4 }. 14 }. Which of the following statements are incorrect and why?

$\phi \subset A$

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77. Let A = { 1, 2, { 3, 4 }. 15 }. Which of the following statements are incorrect and why?

$\{\phi\} \subset A$

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78. Write down all the subsets of the following set :- {a}

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79. Write down all the subsets of the following

set :- {a,b}

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80. Write down all the subsets of the following

set :- {1,2,3}

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81. Write down all the subsets of the following set :- ϕ

82. How many elements has P(A), if $A = \phi$?

83. Write the following as intervals :

$\{x : x \in R, \ -4 < x \leq 6\}$

84. Write the following as intervals :

$$\{x : x \in R, \ -12 < x < -10\}$$

85. Write the following as intervals :

$$\{x : x \in R, 0 \le x < 7\}$$

86. Write the following as intervals :

$\{x : x \in R, 3 \le x \le 4\}$

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87. Write the following interval in set-builder form : (-3,0)

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88. Write the following interval in set-builder form : [6,12]

89. Write the following interval in set-builder form : (6,12]

90. Write the following interval in set-builder form : [-23,5)

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91. What universal set(s) would you propose for each of the following : (i) The set of right triangles. (ii) The set of isosceles triangles.

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92. Given the sets A = {1, 3, 5), B = {2, 4, 6} and C = {0, 2, 4, 6, 8), which of the following may be considered as universal set (s) for all the three sets A, B and C (i) {0,1, 2, 3, 4, 5, 6} (ii) ϕ (iii) {0,1,2,3,4,5,6,7,8,9,10} (iv) {1,2,3,4,5,6,7,8}

A. {0,1, 2, 3, 4, 5, 6}

B. ϕ

C. {0,1,2,3,4,5,6,7,8,9,10}

D. {1,2,3,4,5,6,7,8}

Answer:

93. Find the union of each of the following pairs of set : X = {1, 3, 5} Y= {1, 2, 3}

94. Find the union of each of the following pairs of set : A = [a, e, i, o, u} B = {a, b, c}

95. Find the union of each of the following pairs of set : A = {x : x is a natural number and multiple of 3} B = {x : x is a natural number less than 6}

96. Find the union of each of the following pairs of set : A = {x : x is a natural number and $1 < x \leq 6$ } B = {x : x is a natural number and 6 < x < 10 }

97. Find the union of each of the following pairs of set : A={1,2,3},B= ϕ

98. Let A = { a, b }, B = {a, b, c}. Is A $\subset$ B ? What is A $\cup$ B?

99. If A and B are two sets such that $A \subset B$, then what is $A \cup B$?

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100. If A= {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {5, 6, 7, 8 }and D = { 7, 8, 9, 10 }, find:- $A \cup B$

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101. If A= {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {5, 6, 7, 8 }and D = { 7, 8, 9, 10 }, find:- $A \cup C$

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102. If A= {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {5, 6, 7, 8 }and D = { 7, 8, 9, 10 }, find:- $B \cup C$

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103. If A= {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {5, 6, 7, 8 }and D = { 7, 8, 9, 10 }, find:- $B \cup D$

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104. If A= {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {5, 6, 7, 8 }and D = { 7, 8, 9, 10 }, find:- $A \cup B \cup C$

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105. If A= {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {5, 6, 7, 8 }and D = { 7, 8, 9, 10 }, find:- $A \cup B \cup D$

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106. If A= {1, 2, 3, 4}, B = {3, 4, 5, 6}, C = {5, 6, 7, 8 } and D = { 7, 8, 9, 10 }, find:- $B \cup C \cup D$

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107. Find the intersection of each of the following pairs of set :- X = {1, 3, 5} Y= {1, 2, 3}

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108. Find the intersection of each of the following pairs of set :- A = [a, e, i, o, u} B = {a, b, c}

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109. Find the intersection of each of the following pairs of set :- A ={x : x is a natural number and multiple of 3} B = {x : x is a natural number less than 6}

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110. Find the intersection of each of the following pairs of set :- A = {x : x is a natural number and $1 < x \leq 6$ } B = {x : x is a natural number and 6 < x < 10 }

111. Find the intersection of each of the following pairs of set :- A={1,2,3},B= ϕ

112. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $A \cap B$

113. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $B \cap C$

114. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $A \cap C \cap D$

115. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $A \cap C$

116. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $B \cap D$

117. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $A \cap (B \cup C)$

118. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $A \cap D$

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119. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}andD = {15, 17}, find:- $A \cap (B \cup D)$

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120. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}and D = {15, 17}, find:- $(A \cap B) \cap (B \cup C)$

121. If A = { 3, 5, 7, 9, 11 }, B = {7, 9, 11, 13}, C = {11, 13, 15}and D = {15, 17}, find:- $(A \cup D) \cap (B \cup C)$

122. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number}and D = {x : x is a prime number }, find :- $A \cap B$

123. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number}and D = {x : x is a prime number }, find :- $A \cap C$

124. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number}and D = {x : x is a prime number }, find :- $A \cap D$

125. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd

natural number}and D = {x : x is a prime

number }, find :- $B \cap C$

126. If A = {x : x is a natural number }, B = {x : x is

an even natural number} C = {x : x is an odd

natural number}and D = {x : x is a prime

number }, find :- $B \cap D$

127. If A = {x : x is a natural number }, B = {x : x is an even natural number} C = {x : x is an odd natural number}and D = {x : x is a prime number }, find :- $C \cap D$

128. Which of the following pairs of sets are disjoint:- {1, 2. 3, 4} and {x : x is a natural number and $4 \leq x \leq 6$}

129. Which of the following pairs of sets are disjoint:- { a, e, i, o, u } and { c, d, e, f}

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130. Which of the following pairs of sets are disjoint:- {x : x is an even integer } and {x : x is an odd integer}

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131. 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:- A-B

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132. 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:- A-C

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133. 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:-A-D

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134. 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:- B-A

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135. 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:- C-A

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136. 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:- D-A

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137. 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:- B-C

138. 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:- B-D

139. 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:- C-B

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140. 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:- D-B

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141. 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:- C-D

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142. 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:- D-C

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143. If X= { a, b, c, d } and Y ={f, b, d, g}, find:- X-Y

144. If X= { a, b, c, d } and Y ={f, b, d, g}, find:- Y-X

145. If X= { a, b, c, d } and Y ={f, b, d, g}, find:-

$X \cap Y$

146. If R is the set of real numbers and Q is the set of rational numbers, then what is R-Q?

147. State the following statement is true or false. Justify your answer. { 2, 3, 4, 5 } and { 3, 6} are disjoint sets.

148. State the following statement is true or false. Justify your answer. {a, e, i, o, u } and { a, b, c, d }are disjoint sets.

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149. State the following statement is true or false. Justify your answer. { 2, 6, 10, 14 } and { 3, 7, 11, 15} are disjoint sets.

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150. State the following statement is true or false. Justify your answer. { 2, 6, 10 } and { 3, 7, 11} are disjoint sets.

151. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find:- A'

152. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find:- B'

153. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find:- $(A \cup C)'$

154. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find:- (A u B)'

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155. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find:- (A')'

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156. Let U = { 1, 2, 3, 4, 5, 6, 7, 8, 9 }, A = { 1, 2, 3, 4}, B = { 2, 4, 6, 8 } and C = { 3, 4, 5, 6 }. Find:- (B - C)'

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157. If U = { a, b, c, d, e, f, g, h}, find the complements of the following set : A = {a, b, c}

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158. If U = { a, b, c, d, e, f, g, h}, find the complements of the following set : B={d, e, f, g}

159. If U = { a, b, c, d, e, f, g, h}, find the complements of the following set : C = {a, c, e, g}

160. If U = { a, b, c, d, e, f, g, h}, find the complements of the following set : D = {f, g, h, a}

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161. Taking the set of natural numbers as the universal set, write down the complements of the following set: {x : x is an even natural number}

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162. Taking the set of natural numbers as the universal set, write down the complements of the following set: { x : x is an odd natural number }

163. Taking the set of natural numbers as the universal set, write down the complements of the following set: {x : x is a positive multiple of 3}

164. Taking the set of natural numbers as the universal set, write down the complements of the following set: { x : x is a prime number }

165. Taking the set of natural numbers as the universal set, write down the complements of

the following set: {x : x is a natural number divisible by 3 and 5}

166. Taking the set of natural numbers as the universal set, write down the complements of the following set: { x : x is a perfect square }

167. Taking the set of natural numbers as the universal set, write down the complements of the following set: { x : x is a perfect cube}

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168. Taking the set of natural numbers as the universal set, write down the complements of the following set: $\{x : x + 5 = 8\}$

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169. Taking the set of natural numbers as the universal set, write down the complements of the following set: $\{x : 2x + 5 = 9\}$

170. Taking the set of natural numbers as the universal set, write down the complements of the following set: $\{x : x \geq 7\}$

171. Taking the set of natural numbers as the universal set, write down the complements of the following set: $\{\, x : x \in N \text{ and } 2x + 1 > 10 \,\}$

172. If U ={1,2, 3, 4, 5, 6, 7, 8, 9 }, A = {2, 4, 6, 8} and B = { 2, 3, 5, 7}. Verify that $(A \cup B)' = A' \cap B'$

173. If U ={1,2, 3, 4, 5, 6, 7, 8, 9 }, A = {2, 4, 6, 8} and B = { 2, 3, 5, 7}. Verify that $(A \cap B)' = A' \cup B'$

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174. Draw appropriate Venn diagram for the following : $(A \cup B)'$

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175. Draw appropriate Venn diagram for the following : $A' \cap B'$

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176. Draw appropriate Venn diagram for the following : $(A \cap B)'$

▶ Watch Video Solution

177. Draw appropriate Venn diagram for the following : $A' \cup B'$

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178. Let U be the set of all triangles in a plane. If A is the set of all triangles with at least one angle different from $60°$, what is A'?

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179. Fill in the blanks to make the following a true statement : $A \cup A' = \ldots$

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180. Fill in the blanks to make the following a true statement : $\phi' \cap A = \ldots$

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181. Fill in the blanks to make the following a true statement : $A \cap A' = ...$

182. Fill in the blanks to make the following a true statement : $U' \cap A = ...$

183. If X and Y are two sets such that n (X) = 17, n (Y) = 23 and $n(X \cup Y) = 38$, find $n(X \cap Y)$.

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184. If X and Y are two sets such that $X \cup Y$ has 18 elements, X has 8 elements andY has 15 elements , how many elements does $X \cap Y$ have?

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185. In a group of 400 people, 250 can speak Hindi and 200 can speak English. How many people can speak both Hindi and English?

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186. If S and T are two sets such that S has 21 elements, T has 32 elements, and $S \cap T$ has 11 elements, how many elements does $S \cup T$ have?

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187. If X and Y are two sets such that X has 40 elements, $X \cup Y$ has 60 elements and $X \cap Y$ has 10 elements, how many elements does Y have?

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188. In a group of 70 people, 37 like coffee, 52 like tea and each person likes at least one of

the two drinks. How many people like both coffee and tea?

189. In a group of 65 people, 40 like cricket, 10 like both cricket and tennis. How many like tennis only and not cricket? How many like tennis?

190. In a committee, 50 people speak French, 20 speak Spanish and 10 speak both Spanish and French. How many speak at least one of these two languages?

191. Decide, among the following sets, which sets are subsets of one and another: A = { x : x ∈ R and x satisfy $x^2 - 8x + 12 = 0$ }, B = { 2, 4, 6 }, C = { 2, 4, 6, 8, . . . }, D = { 6 }.

192. In the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. If x $\in$ A and A $\in$ B , then x $\in$ B

193. In the following, determine whether the statement is true or false. If it is true, prove it.

If it is false, give an example. If $A \subset B$ and $B \in C$, then $A \in C$

194. In the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. If $A \subset B$ and $B \subset C$, then $A \subset C$

195. In the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. If $A \not\subset B$ and $B \not\subset C$, then $A \not\subset C$

196. In the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. If $x \in A$ and $A \not\subset B$, then $x \in B$

197. In the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. If $A \subset B$ and $x \notin B$, then $x \notin A$

198. 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.

199. Show that the following four conditions are equivalent : (i) $A \subset B$ (ii) $A - B = \phi$ (iii) $A \cup B = B$ (iv) $A \cap B = A$

200. Show that if $A \subset B$, then $C - B \subset C - A$.

201. Assume that P(A) = P(B). Show that A = B

202. Is it true that for any sets A and B,

$$P(A) \cup P(B) = P(A \cup B)?$$ Justify your

answer.

203. Show that for any sets A and B,

$$A = (A \cap B) \cup (A - B) \quad \text{and}$$

$$A \cup (B - A) = (A \cup B)$$

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204. Using properties of sets, show that

$$A \cup (A \cap B) = A$$

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205. Using properties of sets, show that

$A \cap (A \cup B) = A$

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206. Show that $A \cap B = A \cap C$ need not imply B = C.

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207. Let A and B be sets. If $A \cap X = B \cap X = \phi$ and $A \cup X = B \cup X$ for some set X, show that A = B. (Hints $A = A \cap (A \cup X), \ B = B \cap (B \cup X)$ and use Distributive law)

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208. Find sets A, B and C such that $A \cap B$, $B \cap C$ and $A \cap C$ are non-empty sets and $A \cap B \cap C = \phi$.

209. In a survey of 600 students in a school, 150 students were found to be taking tea and 225 taking coffee, 100 were taking both tea and coffee. Find how many students were taking neither tea nor coffee?

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210. In a group of students, 100 students know Hindi, 50 know English and 25 know both. Each

of the students knows either Hindi or English. How many students are there in the group?

211. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers. Find: the number of people who read at least one of the newspapers.

212. In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read newspaper I, 9 read both H and I, 11 read both H and T, 8 read both T and I, 3 read all three newspapers. Find: the number of people who read exactly one newspaper.

213. In a survey it was found that 21 people liked product A, 26 liked product B and 29 liked product C. If 14 people liked products Aand B, 12 people liked products C and A, 14 people liked products B and C and 8 liked all the three products. Find how many liked product C only.

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