



MATHS

BOOKS - MBD MATHS (ODIA ENGLISH)

SETS

Question Bank

1. Construct Collection of all the days of a week in the form of set and describe it with the help of proposition.

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2. Construct Collection of writing instruments in the form of set and describe it with the help of proposition.

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3. Construct Collection of all kings having more than one queens in the form of set and describe it with the help of proposition.

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4. Construct Collection of all the nationalised political parties in the form of set and describe it with the help of proposition.

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5. Construct Collection of all integers of multiples of 3 in the form of set and describe it with the help of proposition.

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6. Construct Collection of all fingers of a hand in the form of set and describe it with the help of proposition.

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7. Give an example of a set which has exactly 10 elements and express it through a defining property.

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8. It is possible to express every set through a defining property? Justify your answer.

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9. If $\{x : p_1(x)\} = \{x : p_2(x)\}$, show each x , $p_1(x)$ and $p_2(x)$ have the same truth value.



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10. Write down the set of letters forming that word Administration?



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11. Write down the set of letters forming that word Misrepresentation?



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12. Write down the set of letters forming that word Mathematics?



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13. Write down the set of letters forming that word Concurrence?



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14. Write down the set of letters forming that word Demonstration?

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15. State with reason, "All big rivers of India" is set or not ?

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16. State with reason, "All natural numbers having at least one prime factor " is set or not ?

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17. State with reason, "All sincere students of Ravenshaw college during the academic year 1998-99 " is set or not ?

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18. State with reason, "All real number with negative square " is set or not ?

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19. State with reason, "All citizens of india earning more than Rs.10,000/- per month " is set or not ?

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20. State with reason, " All college teachers who are citizens of India " is set or not ?

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21. State with reason, "All finite subsets of the set Z of integers " is set or not ?

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22. State with reason, "Collection of all possible sets " is set or not ?

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23. State with reason, "Collection of all winged horses " is set or not ?

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24. State with reason, "Collection of all residents of Odisha who will live for more than 100 years " is set or not ?

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25. Write $\{x: x \text{ is a prime number and } 1 \leq x \leq 100\}$ set in the form of lists?

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26. Write $\{x: x \text{ is an odd integer}\}$ set in the form of lists?

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27. Write $\{x: x = 1 \text{ or } x = 2 \text{ or } x = 3\}$ set in the form of lists?

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28. Write $\{x: x \text{ can be written as a sum of two odd integers}\}$ set in the form of lists?

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29. Write "Set of all natural numbers that are divisible by 5" set in the form of lists?

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30. Write $\{a\}$ set in the intention (or specification form).

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31. Write ϕ set in the intention (or specification form).

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32. Write $\{1, 2\}$ set in the intention (or specification form).

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33. Write $\{1, 2, 3, 4, 5\}$ set in the intention(or specification form).

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34. Write $P(\phi)$ set in the intention(or specification form).

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35. Write $\{1, 3, 9, 27\}$ set in the intention(or specification form).

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36. Determine if the set $A=\{1,2,3,\dots\}$ is a proper subset of the set $B=\{x:x \text{ is a rational number}\}$

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37. Determine if the set $A = \{x : x \text{ is a number}\}$ is a proper subset of the set $B = \{2n - 1 : n = 1, 2, 3, \dots\}$

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38. Determine if the set $A = \{-1, 1, 3\}$ is a proper subset of the set $B = \{x : x \in \mathbb{R} \text{ and } x^3 - 2x^2 - x + 2 = 0\}$

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39. Determine if the set $A = \{1, 2, 3, 4\}$ is a proper subset of the set $B = \{n \in \mathbb{N}, n \text{ is a divisor of } 60\}$

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40. Determine if $A \subset B$ or $A \not\subset B$ where $A = \phi$, $B = \{\phi\}$

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41. Determine if $A \subset B$ or $A \not\subset B$ where
 $A = \{x : x \text{ is an integer}\}$, $B = \{3x : x \text{ is an integer}\}$

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42. Determine if $A \subset B$ or $A \not\subset B$ where
 $A = \{x : x \text{ is an odd integer}\}$, $B = \{x : x \text{ is real and not an even integer}\}$

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43. Determine if $A \subset B$ or $A \not\subset B$ where $A = \{x : x \text{ is an integer which is both even and odd}\}$, $B = \{x : x \text{ is an integer, } x \neq x\}$

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44. Determine if $A \subset B$ or $A \not\subset B$ where
 $A = \{a, b, c\}$, $B = \{|a|, |b|, |c|\}$

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45. Determine the truth or falsity of the $\{1, 2\} \in \{1, 2, 3\}$ propositions with reasons.

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46. Determine the truth or falsity of the $A \subset A$ for any set A propositions with reasons.

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47. Determine the truth or falsity of the "Every set has a proper subset" propositions with reasons.



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48. Determine the truth or falsity of the Every set is a proper subset of same set propositions with reasons.



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49. Determine the truth or falsity of the For any object x , there is a set A such that $x \in A$ propositions with reasons.



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50. Determine the truth or falsity of the For any object x , there is a set A such that $x \notin A$ propositions with reasons.



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51. Determine the truth or falsity of the If A, B, C are sets, then either $A = B$ or $A \subset B$ or $B \subset A$ propositions with reasons.

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52. Determine the truth or falsity of the $a \in \{(a)\}$ propositions with reasons.

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53. Determine the truth or falsity of the $a \in \{\{a, b\}, b\}, a \neq b$ propositions with reasons.

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54. Determine the truth or falsity of the If A is a proper subset of B and B is a subset of C Then A is a proper subset of C propositions with

reasons.



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55. Determine the truth or falsity of the proposition $A \subset \phi$ if and only if $A = \phi$ with reasons.



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56. Write down the power set of $\{a, b, c\}$



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57. Write down the power set of $\{a, \{a\}\}$



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58. Write down the power set of ϕ

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59. Write down the power set of $\{\phi\}$

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60. Write down the power set of $\{a, \{a\}, \{a, b\}\}$

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61. Write down the power set of $\{\{\phi\}\}$

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62. The set N of positive natural number set is finite set or infinite set ?

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63. Which sets are finite and which are infinite The set Z of integers

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64. Which of the following set are finite and which are infinite ? The set Q or rational number.

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65. Which of the following set are finite and which are infinite ?The set R of real number.

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66. Which of the following set are finite and which are infinite ? The set of prime number .

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67. Which of the following set are finite and which are infinite ? The set of even integers.

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68. Which of the following set are finite and which are infinite ? The set of human beings

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69. Which of the following set are finite and which are infinite ? The set of integers less than 10.



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70. Verify that $|P(\phi)| = 2^0$



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71. Verify that $|P(\{a\})| = 2^1$



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72. Verify that $|P(\{a, b\})| = 2^2$



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73. Verify that $|P(\{a, b, c\})| = 2^3$



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74. Find the number of element of $P(P(\phi))$

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75. Find the number of element of $P(P(P(\phi)))$

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76. Find the number of element of $P(P(P(P(\phi))))$

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77. Prove by the method of induction that if A has n number of elements, then $|P(A)| = 2^n$.

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78. Can you say how many elements $P(P(A))$ if A has n elements?

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79. An examination was conducted in physics, chemistry and mathematics. If P, C, M denote respectively the sets of students who passed in Physics, in Chemistry and in Mathematics, express the set of candidates who passed in Mathematics and Chemistry, but not in physics using union, intersection and different symbols.

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80. An examination was conducted in physics, chemistry and mathematics. If P, C, M denote respectively the sets of students who passed in Physics, in Chemistry and in Mathematics, express the set of candidates who passed in all the three subjects using union, intersection and different symbols.

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81. An examination was conducted in physics, chemistry and mathematics. If P.C.M. denote respectively the sets of students who passed in Physics, in Chemistry and in Mathematics, express the set of candidates who passed in Mathematics only using union , intersection and different symbols.

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82. An examination was conducted in physics, chemistry and mathematics. If P.C.M. denote respectively the sets of students who passed in Physics, in Chemistry and in Mathematics, express the set of candidates who failed in Mathematics but passed in at least one subject using union , intersection and different symbols.

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83. An examination was conducted in physics, chemistry and mathematics. If P,C,M. denote respectively the sets of students who passed in Physics, in Chemistry and in Mathematics, express the set of candidates who passed in at least two subjects using union , intersection and different symbols.

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84. An examination was conducted in physics, chemistry and mathematics. If P,C,M. denote respectively the sets of students who passed in Physics, in Chemistry and in Mathematics, express the set of candidates who failed in one subject only using union , intersection and different symbols.

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85. What can you say about the set, A,B,if $A \cup B = \phi$

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86. What can you say about the set, A,B,if $A \Delta B = \phi$

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87. What can you say about the set, A,B,if $A \setminus B = \phi$

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88. What can you say about the set, A,B,if $A \setminus B = A$

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89. What can you say about the set, A,B,if $A \cap B = U$.(where U is the universal set)

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90. What can you say about the set, A,B,if $A \setminus B = U$.(where U is the universal set)

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91. Are difference and symmetric difference commutative ? Give reason.

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92. If $B \subset C$, prove that $A \setminus B = A \setminus C$. Is this result true when difference is replaced by symmetric difference ? Give reason.

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93. Prove that $(A \setminus B) \setminus C = (A \setminus C) \setminus B = A \setminus (B \cup C)$



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94. Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

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95. Prove the $A \Delta (B \Delta C) = (A \Delta B) \Delta C$

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96. Prove the $A \subseteq B$

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97. Prove the $A \cup B = U$ and $A \cap B = \phi \Rightarrow B = A'$

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98. Prove the $A \cup B = A$ for all $A \Rightarrow B = \phi$

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99. Prove the $A \cup B = B \cup A$ results of the sections 1.13 and 1.14 that are stated with our proof.

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100. Prove the $A \cap B = B \cap A$ results of the sections 1.13 and 1.14 that are stated with our proof.

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101. Prove that $A \cap (B \cup C) = (A \cap B) \cup (A \cap C)$

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102. Prove that $A - \bigcup_{i=1}^n B_i = \bigcap_{i=1}^n (A - B_i)$

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103. Prove that $|A \cup B \cup C|$
 $= |A| + |B| + |C| + |A \cap B \cap C| - |A \cap B| - |B \cap C| - |C \cap A|$

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104. If X and Y are two sets such that $X \cup Y$ has 20 objects, X has 10 objects and Y has 15 objects; how many objects does $X \cap Y$ have ?

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105. In a group of 450 people, 300 can speak Hindi and 250 can speak English. How many people can speak both Hindi and English ?



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106. In a group of people, 37 like coffee, 52 like tea and each person in the group likes at least one of the two drinks. 19 people like both tea and coffee, how many people are in the group?

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107. In a class of 35 students, each student likes to play either cricket or hockey . 24 students like to play cricket and 5 students like to play both the games, how many students play hockey ?

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108. In a class of 400 Students, 100 were listed as taking apple juice, 150 as taking orange juice and 75 were listed as taking both apple as

well as orange juice. Find how many students were taking neither apple juice or orange juice?

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109. 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 ?

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110. 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 C and A. 14 people liked products B and C And 8 liked all the three products, find how many liked products C only.

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