PERSONAL PAPER

PANDEYPUR

QUESTION BANK (SETS) Class 11 - Mathematics

1.	The number of subsets (Improper) of a set containing n elements is		[1]
	a) 2 ⁿ	b) 2 ⁿ - 1	
	c) 2 ⁿ - 2	d) n	
2.	Two finite sets have m and n elements respectively. The total number of subsets of the second set. The values of	ne total number of subsets of first set is 56 more than the of m and n respectively are.	[1]
	a) 5, 1	b) 7, 6	
	c) 8, 7	d) 6, 3	
3.	If A = {x : $x \neq x$ } represents		[1]
	a) {1}	b) { }	
	c) {x}	d) {0}	
4.	For any two sets A and B, $A \cup B = A$ if		[1]
	a) A = B	b) B∈A	
	c) A \neq B	d) $B\subseteq A$	
5.	For any two sets A and B, $A \cap (A \cup B)$ =		[1]
	a) none of these	b) B	
	c) <i>φ</i>	d) A	
6.	Let F_1 be the set of parallelograms, F_2 the set of rectan	ngles, F_3 the set of rhombuses, F_4 the set of squares and F_5	[1]
	the set of trapeziums in a plane. Then F_1 may be equal to		
	a) $F_2 \cap F_3$	b) $F_3 \cap F_4$	
	c) $F_2 \cup F_5$	d) $F_2 \cup F_3 \cup F_4 \cup F_1$	
7.	Let A = $\{x: x ot \in R, x \geqslant 4\}$ and B = $\{x: x ot \in R, x <$	5} then $A \cap B$ is	[1]
	a) {5, 4}	b) {4, 5}	
	c) {4}	d) $\{x: x\in R, \ 4\leq x<5\}$	
8.	If sets A and B are defined as A = $ig\{(x,y) y=rac{1}{x},0 eq$	$\in x \in \mathbf{R}$, B = {(x, y) y = -x, x \in R}, then	[1]
	a) $A \cap B = A$	b) $A \cup B = A$	
	c) A \cap B = ϕ	d) $A \cap B = B$	
9.	If $A \subset B$, then		[1]

	a) $A^c \subset B^c$	b) $B^c ot\subset A^c$	
	c) $A^c = B^c$	d) $B^c \subset A^c$	
10.	Suppose A_1 , A_2 ,, A_{30} are thirty sets each having 5		[1]
	elements. Let $\displaystyle igcup_{i=1}^{30} A_i = \displaystyle igcup_{j=1}^n B_j = S$ and each element	nt of S belongs to exactly 10 of $A_i^{\prime s}$ and exactly 9 of $B_i^{\prime s}.$	
	Then n is equal to.		
	a) 3	b) 15	
	c) 45	d) 35	
11.	If A = {(x, y) : $x^2 + y^2 = 25$ } and B = {(x, y) : $x^2 + 9$	$y^2 = 144$ } then A \cap B contains	[1]
	a) three points	b) two points	
	c) one point	d) four points	
12.	Given the sets A = {1, 2, 3}, B = {3, 4}, C = {4, 5, 6	}, then $A \cup (B \cap C)$ is	[1]
	a) {1, 2, 3}	b) {3}	
	c) {1, 2, 3, 4, 5, 6}	d) {1, 2, 3, 4}	
13.	Let A = { $x : x \in R, x > 4$ } and B = { $x \in R : x < 5$ }.	Then, $A \cap B$ =	[1]
	a) [4, 5)	b) [4, 5]	
	c) (4, 5]	d) (4, 5)	
14.	If A = { $x : x$ is a multiple of 3, x natural no., $x < 30$ } then A - B is	and B = {x : x is a multiple of 5, x is natural no., $x < 30$ }	[1]
	a) {3, 6, 9, 12, 15, 18, 21, 24, 27, 30}	b) {3, 6, 9, 12, 18, 21, 24, 27}	
	c) {3, 5, 6, 9, 10, 12, 15, 18, 20, 21, 25, 27, 30}	d) {3, 6, 9, 12, 18, 21, 24, 27, 30}	
15.	The smallest set A such that $A \cup \{1, 2\} = \{1, 2, 3, 5, 9\}$ is		[1]
	a) {1, 2, 5, 9}	b) {4, 5, 6}	
	c) {3, 5, 9}	d) {2, 3, 5}	
16.	Let A and B be two non- empty subsets of a set X such that A is not a subset of B, then		[1]
	a) A and the complement of B are always non- disjoint	b) none of these	
	c) A and B are always disjoint	d) B is always a subset of A	
17.	Two finite sets have m and n elements. The number set. The values of m and n are, respectively,	of subsets of the first set is 112 more than that of the second	[1]
	a) 7, 7	b) 4, 4	
	c) 7, 4	d) 4, 7	
18.	Each set X_r contains 5 elements and each set Y_r cont	tains 2 elements and $\displaystyle \bigcup_{r=1}^{20} x_r = S = \displaystyle \bigcup_{r=1}^n Y_r$. If each element	[1]
	of S belong to exactly 10 of the X_r 's and to exactly 4		

	-) 10	L) 20	
	a) 10	b) 20	
	c) 50	d) 100	
19.	In a set builder method the null set is represented by		[1]
	a) { $x : x = x$ }	b) ϕ	
	c) { }	d) (x: $x \neq x$).	
20.	The set of all prime numbers is		[1]
	a) an infinite set	b) a singleton set	
	c) none of these	d) a finite set	
21.	Write the set in the roster form: $A = \{$ set of all factors		[1]
22.	If A = {3, 5, 7, 9, 11}, B = {7, 9, 11, 13}, C = {11, 13,		[1]
23.	Write the correct form if the statement is incorrect: {x	,	[1]
24.	Express the set as an interval: $D = \{x : x \in R, -5 \le x\}$		[1]
25.	Write the subsets of R as an interval: C = { $x : x \in R$, -		[1]
26.	State whether $A \subset B$ or $A \not\subset B$: $A = \{x : x \text{ is a real nu} $	mber}, B = $\{x : x \text{ is a complex number}\}$	[1]
27.	Write the interval [6, 12] in set builder form.		[1]
28.	Write the set in roster form: $C = {x : x is a two-digit national constants of the two-digit national constants of the two-digits of two-digits of the two-digits of $	5	[1]
29.	If X and Y are subsets of the universal set U, then show	w that $X \subset Y \Rightarrow X \cap Y = X$	[1]
30.	Write the interval (-7, 0) in set-builder form.		[1]
31.	If X = {a, b, c, d} and Y = {f, b, d, g} find: $Y - X$		[1]
32.	If A = {3, 5, 7, 9, 11}, B = {7, 9, 11, 13}, C = {11, 13,		[1]
33.	List element of the given set: $C = {x : x is an integer, 2}$		[1]
34.	State whether C = {x : $4 \le x \le 5$, x \in N} set is empty s		[1]
35.	Write the subsets of R as intervals: { $x : x \in R, -12 < x$		[1]
36.	If $A = \{1, 3, 5, 7, 9\}$ and $B = \{2, 3, 5, 7, 11\}$, then find		[2]
37.		4, 6, 8, 12, 20}, B = {3, 6, 9, 12, 15}, C = {5, 10, 15, 20}	[2]
	and U is the set of all whole numbers, draw a Venn dia	gram showing the relation of U, A, B and C.	
38.	Write down all possible subsets of $A = (1, \{2, 3\})$.		[2]
39.	In a group of students, 100 students know Hindi, 50 kr	-	[2]
	knows either Hindi or English. How many students are	U I	503
40.	If $A = \{a, b, c, d, e\}, B = \{a, c, e, g\}$ and $C = \{b, e, f, g\}$		[2]
41.	Let $X = \{1, 2, 3, 4, 5, 6\}$. If n represent any member of	-	[2]
42.		subsets of the first set is 112 more than that of the second	[2]
40	set. Find the values of m and n.	T	[0]
43.	Let T = $\left\{ x : \frac{x+5}{x-7} - 5 = \frac{4x-40}{13-x} \right\}$. Is T an empty set?	Justify your answer.	[2]
44.	Show that $A \cap B = A \cap C$ need not imply B = C.		[2]
45.	Let $A = \{a, b, c, d\}, B = \{a, b, c\}$ and $C = \{b, d\}$. Find		[2]
46.	If A = {a, b, c, d, e}, B = {a, c, e, g} and C = {b, e, f, g		[2]
47.	If A and B are subsets of the universal set U, then show	w that	[2]
	$(A \cap B) \subset A$		
48.	For sets A, B and C using properties of sets, prove that	$t: A \cap (B - C) = (A \cap B) - (A \cap C).$	[2]
49.	Is $B = \{x : x \in N, 2x + 3 = 4\}$ null set?		[2]

50.	Given L = {1, 2, 3, 4}, M = {3, 4, 5, 6} and N = {1, 3, 5} Verify that L – $(M \cup N) = (L - M) \cap (L - N)$	[2]
51.	Let A and B be two sets. Then, prove that $A = B \Leftrightarrow A \subseteq B$ and $B \subseteq A$.	[2]
52.	If A = {x : x \in N, x \leq 7], B = {x : x is prime, x < 8} and C = [x : x \in N, x is odd and x < 10}, verify that: A \cap	[2]
	$(B \cup C) = (A \cap B) \cup (A \cap C)$	
53.	Write the set A = $\{a_n : n \in \mathbb{N}, a_{n+1} = 3a_n \text{ and } a_1 = 1\}$ in the roster form.	[2]
54.	Is the pair of set A = {2, 3} and B = {x : x is solution of $x^2 + 5x + 6 = 0$ } equal? Give reason.	[2]
55.	Write the set in roster form: D = {x : x is an integer, $x^2 \le 9$ }	[2]
56.	Let A, B and C be three sets, then prove that: $A-(B-C)=(A-B)\cap (A\cap C)$	[3]
57.	List element of the given set: $A = \{x : x \text{ is an odd natural number}\}$	[3]
58.	For all sets A, B and C	[3]
	Is $(A - B) \cap (C - B) = (A \cap C) - B$?	
	Justify your answer.	
59.	Using properties of set prove the statement. For all sets A and B, prove that $A\cup (B-A)=A\cup B$.	[3]
60.	In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read	[3]
	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.	
61.	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]
62.	If $A \subset B$, show that $(B' - A') = \phi$.	[3]
	Hint $A \subset B \Rightarrow B' \subset A' \Rightarrow B' - A' = \phi$.	
63.	Is the set of lines which are parallel to the x-axis finite or infinite?	[3]
64.	Let A and B be two sets. Using properties of sets prove that:	[3]
	i. A \cap B' = $\phi \Rightarrow$ A \subset B	
	ii. A' \cup B = U \Rightarrow A \subset B	
65.	List all the element of the sets: $H = \{x : x \in Z, x \le 2\}$	[3]
66.	State whether the statements is true or false: {2,3, 4, 5} and {3, 6} are disjoint sets.	[3]
67.	If U = {2, 3, 5, 7, 9} is the universal set and A = {3, 7}, B = {2, 5, 7, 9}, then prove that: $(A \cap B)' = A' \cup B'$.	[3]
68.	Let A, B and C be sets. Then show that	[3]
	$A\cap (B\cup C)=(A\cap B)\cup (A\cap C)$	
69.	In a survey of 60 people, it was found that 25 people read newspaper H, 26 read newspaper T, 26 read	[3]
	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 newspaper.	
70.	Assume that $P(A) = P(B)$ show that $A = B$.	[3]
71.	Out of 100 students; 15 passed in English, 12 passed in Mathematics, 8 in Science, 6 in English and	[3]
	Mathematics, 7 in Mathematics and Science, 4 in English and Science, 4 in all the three. Find how many passed	
	i. in English and Mathematics but not in Science	
	ii. in Mathematics and Science but not in English	
	iii. in Mathematics only	
	iv. in more than one subject only	
72.	Let A = {a, e, i, o, u}, B = {a, d, e, o, v} and C = {e, o, t, m]. Using Venn diagrams, verify that: A \cup (B \cap C) =	[3]
	$(A \cup B) \cap (A \cup C)$	
73.	Let A = {2, 4, 6, 8, 10}, B = {4, 8, 12, 16} and C = {6, 12, 18, 24}. Using Venn diagrams, verify that: (A \cup B) \cup	[3]
	$C = A \cup (B \cup C)$	

- 74. If U = {1, 2, 3, 4, 5, 6, 7, 8, 9}, A = {2, 4, 6, 8} and B = {2, 3, 5, 7}, verify that: $(A \cap B)' = A' \cup B'$. [3]
- 75. Let A, B and C be three sets such that $A \cup B = C$ and $A \cap B = \phi$ then prove that A = C B.

[3]