ASSIGNMENT ON SETS

LEVEL 1 (CBSE/NCERT/STATE BOARDS)

1	What is the difference between a collection and a set? Give reasons to support your answer?
2	If A = {0,1,2,3,4,5,6, 7,8,9,10}, then insert the appropriate symbol $\in$ or $\notin$ in each of the following blank spaces: (i) 4.....A (ii) -4......A (iii) 12 ....A (iv) 9 ....A (v) 0.....A (vi) -2.....A
3	Write the set of all integers whose cube it an even integer.
4	Write the set of all real numbers which cannot be written as the quotient of two integers in the set-builder form.
5	Describe each of the following sets in Roster form (i) {x :x is a positive integer and a divisor of 9} (ii) {x : x $\in$ Z and | x | ≤2} (iii) {x :x is a letter of the word 'PROPORTION'} (iv) $\left\{x : \frac{n}{n^2+1} \text{ and } 1 \le n \le 3, \text{where } n \in N\right\}$
6	Write the set $\left\{\frac{1}{2}, \frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{5}{6}, \frac{6}{7}, \frac{7}{8}, \frac{8}{9}, \frac{9}{10}\right\}$ in the set-builder form.
7	Write the set X = $\left\{1, \frac{1}{4}, \frac{1}{9}, \frac{1}{16}, \frac{1}{25}, ...\right\}$ in the set -builder form.
8	Let A and B be two sets having 3 and 6 elements respectively. Write the minimum number of elements that $A \cup B$ can have.
9	Let A = {x : x $\in$ N, x is a multiple of 3) and B = {x : x $\in$ N and x is a multiple of 5}. Write $A \cap B$.
10	If A = {(x, y) : y = $\frac{1}{x}$, $0 \ne x \in R$} and B = {(x, y) : y = -x ,x $\in$ R}, then write $A \cap B$.
11	If A = {(x, y) : y = e^x, x $\in$ R} and B = {(x, y): y = e^{-x}, x $\in$ R), then write $A \cap B$.
12	Write the following sets in Roster form: (i) A = $\{a_n : n \in N, a_{n+1} = 3a_n \text{ and } a_1 = 2\}$ (ii) B = $\{a_n : n \in N, a_{n+2} = a_{n+1} + a_n, a_1 = a_2 = 1\}$
13	Describe the following sets in set-builder form:

	(i) A = {1, 2,3,4,5, 6}; (ii) B = {1,1/2, 1/3, 1/4, 1/5,...}; (iii) C = {0,3, 6, 9,12,...}; (iv) D = {10,11,12,13,14,15};
14	State which of the following sets are finite and which are infinite: (i) A = {x : x $\in$ Z and x^2 - 5x + 6 = 0} (ii) B = {x : x $\in$ Z and x^2 is even} (iii) C = {x : x $\in$ Z and x^2 = 36} (iv) D = {x :x $\in$ Z and x > -10}
15	Consider the following sets:ϕ, A = {1, 2), B = {1,4,8}, C = {1,2,4,6, 8} Insert the correct symbol $\subset$ or $\not\subset$ between each of the following pair of sets: (i) ϕ...B (ii) A...B (iii) A... C (iv) B ... C
16	In each of the following, determine whether the statement is true or false. If it is true, prove it. If it is false, give an example. (i) If x $\in$ A and A $\in$ B, then x $\in$ B (ii) If A $\subset$ B and B $\subset$ C, then A $\subset$ C (iii) If A $\subset$ B and B $\subset$ C, then A $\subset$ C (iv) If A $\not\subset$ B and B $\not\subset$ C, then A $\not\subset$ C (v) If x $\in$ A and A $\not\subset$ B, then x $\in$ B (vi) If A $\subset$ B and x $\in$ B, then x $\in$ A
17	Write the following subsets of R as intervals: (i) {x : x$\in$ R,-4 < x ≤ 6} (ii) {x : x $\in$ R,- 12 < x < -10} (iii) {x : x $\in$ R, 0 ≤ x < 7} (iv) {x : x $\in$ R,3 ≤ x ≤ 4}.
18	Which of the following statements are correct? Write a correct form of each of the incorrect statements. (i) a $\subset$ {a, b, c} (ii) {a} $\in$ {a, b, c} (iii) a $\in$ {{a}, b} (iv) {a} $\subset$ {{a),b} (v) {b, c} $\subset$ {a, {b, c}} (vi) {a, b} $\subset$ {a, {b, c}} (vii) ϕ $\in$ {a, b} (viii) ϕ $\subset$ {a, b, c} (ix) {x : x + 3 = 3} = ϕ
19	Let A = {a, b, {c, d},e}. Which of the following statements are false and why? (i) {c . d} $\subset$ A (ii) {c, d} $\in$ A (iii) {{c, d}} $\subset$ A (iv) a $\in$ A (v) a $\subset$ A (vi) {a, b, e} $\subset$ A (vii) {a, b, e} $\in$ A (viii) {a, b, c} $\subset$ A (ix) ϕ $\in$ A (x) {ϕ} $\subset$ A
20	Let A = {ϕ, {ϕ}, 1, {1, 0}, 2}, Which of the following are true? (i) ϕ $\in$ A (ii) {ϕ} $\in$ A (iii) {1} $\in$ A (iv) {2, ϕ} $\subset$ A (v) 2 $\subset$ A (vi) {2, {1}} $\not\subset$ A (vii) {{2}, {1}} $\not\subset$ A (viii) {ϕ, {ϕ}, {1, ϕ}} $\subset$ A (ix) {{ϕ}} $\subset$ A.

21	If A = {1, 3, 5, 7,11,13, 15, 17}, B = {2, 4, 6,..., 18} and N is the universal set, then find $A' \cup ((A \cup B) \cap B')$.
22	Suppose $A_1, A_2, \ldots\ldots\ldots A_{30}$ are thirty sets each with five elements and $B_1, B_2, \ldots, B_n$ are n sets each with three elements. Let $\bigcup_{i=1}^{30} A_i = \bigcup_{j=1}^{n} B_j = S$. Assume that each element of S belongs to exactly ten of the A_i's and exactly 9 f B_j's. Find n.
23	Find sets A, B and C such that $A \cap B, A \cap C$ and $B \cap C$ are non-empty sets and $A \cap B \cap C = \phi$.
24	For any two sets A and B, show that the following statements are equivalent: (i) $A \subset B$ (ii) $A - B = 0$ (iii) $A \cup B = B$ (iv) $A \cap B = A$.
25	For three sets A, B and C, show that (i) $A \cap B = A \cap C$ need not imply $B = C$ (ii) $A \subset B \Rightarrow C - B \subset C - A$
26	In a group of 50 people, 35 speak Hindi, 25 speak both English and Hindi and all the people speak at least one of the two languages. How many people speak only English and not Hindi 1 How many people speak English?
27	There are 200 individuals with a skin disorder, 120 has been exposed to chemical C_1, 50 to chemical C_2 and 30 to both the chemicals C_1 and C_2. Find the number of individuals exposed to (i) chemical C_1 or chemical C_2 (ii) chemical C_1 but not chemical C_2 (iii) chemical C_2 but not chemical C_1.
28	A market research group conducted a survey of 2000 consumers and reported that 1720 consumers liked product P_1 and 1450 consumers liked product P_2. What is the least number that must have liked both the products ?
29	In a survey of 700 students in a college, 180 were listed as drinking Limca, 275 as drinking Miranda and 95 were listed as both drinking Limca as well as Miranda. Find how many students were drinking neither Limca nor Miranda.
30	In a class of 35 students, 17 have taken mathematics, 10 have taken mathematics but not economics. Find the number of students who have taken both mathematics and economics and the number of students who have taken economics but not mathematics, if it is given that each student has taken either mathematics or economics or both.

31	In a town of '10,000 families it was found that 40% families buy newspaper A, 20% families buy newspaper B and 10% families buy newspaper C. 5% families buy A and B, 3% buy B and C and 4% buy A and C. If 2% families buy all the three news papers, find the number of families which buy (i) A only (ii) B only (in) none of A, B and C.
32	A college awarded 38 medals in Football, 15 in Basketball and 20 to Cricket. If, these medals went to a total of 58 men and only three men got medals in all the three sports, how many received medals in exactly two of the three sports ?
33	In a survey of 25 students, it was found that 15 had taken mathematics, 12 had taken physics and 11 had taken chemistry, 5 had taken mathematics and chemistry, 9 had taken mathematics and physics, 4 had taken physics and chemistry and 3 had taken all the three subjects.Find the number of students that had (i) only chemistry. (ii) only mathematics. (iii) only physics. (iv) physics and chemistry but not mathematics. (v) mathematics and physics but not chemistry. (vi) only one of the subjects. (vii) at least one of the three subjects. (viii) none of the subjects.
34	Of the members of three athletic teams in a certain school, 21 are in the basketball team, 26 in hockey team and 29 in the football team. 14 play hockey and basket ball, 15 play hockey and football, 12 play football and basketball and 8 play all the three games. How many members are there in all ?
35	A survey of 500 television viewers produced the following information; 285 watch football, 195 watch hockey, 115 watch basketball, 45 watch football and basketball, 70 watch football and hockey, 50 watch hockey and basketball, 50 do not watch any of the three games. How many watch all the three games? How many watch exactly one of the three games ?
36	In a survey it was found that 21 persons liked product P_1, 26 liked product P_2 and 29 liked product P_3. If 14 persons liked products P_1 and P_2; 12 persons liked product P_3 and P_1; 14 persons liked products P_2 and P_3 and 8 liked all the three products. Find how many liked product P_3 only.

ASSIGNMENT ON SETS

LEVEL 2 (OBJECTIVE QUESTIONS FOR IIT-MAIN AND OTHER ENTRANCES)

1. The set of intelligent students in a class is **[AMU 1998]**
   (a) A null set
   (b) A singleton set
   (c) A finite set
   (d) Not a well defined collection

2. Which of the following is the empty set **[Karnataka CET 1990]**
   (a) $\{x : x$ is a real number and $x^2 - 1 = 0\}$
   (b) $\{x : x$ is a real number and $x^2 + 1 = 0\}$
   (c) $\{x : x$ is a real number and $x^2 - 9 = 0\}$
   (d) $\{x : x$ is a real number and $x^2 = x + 2\}$

3. The set $A = \{x : x \in R, x^2 = 16$ and $2x = 6\}$ equals **[Karnataka CET 1995]**
   (a) ϕ (b) {14, 3, 4}
   (c) {3} (d) {4}

4. If a set *A* has *n* elements, then the total number of subsets of *A* is **[Roorkee 1991; Karnataka CET 1992, 2000]**
   (a) n (b) n^2
   (c) 2^n (d) $2n$

5. The number of proper subsets of the set {1, 2, 3} is **[JMIEE 2000]**
   (a) 8 (b) 7
   (c) 6 (d) 5

6. Given the sets $A = \{1, 2, 3\}$, $B = \{3, 4\}$, *C* = {4, 5, 6}, then $A \cup (B \cap C)$ is **[MNR 1988; Kurukshetra CEE 1996]**
   (a) {3} (b) {1, 2, 3, 4}
   (c) {1, 2, 4, 5} (d) {1, 2, 3, 4, 5, 6}

7. If *A* and *B* are any two sets, then $A \cup (A \cap B)$ is equal to **[Karnataka CET 1996]**
   (a) *A* (b) *B*
   (c) A^c (d) B^c

8. If *A* and *B* are two given sets, then $A \cap (A \cap B)^c$ is equal to **[AMU 1998; Kurukshetra CEE 1999]**
   (a) A (b) B
   (c) ϕ (d) $A \cap B^c$

9. If the sets *A* and *B* are defined as
   $A = \{(x, y) : y = \frac{1}{x}, 0 \neq x \in R\}$
   $B = \{(x, y) : y = -x, x \in R\}$, then
   (a) $A \cap B = A$ (b) $A \cap B = B$
   (c) $A \cap B = \phi$ (d) None of these

10. Let $A = [x : x \in R, |x| < 1]$; $B = [x : x \in R, |x - 1| \geq 1]$ and $A \cup B = R - D$, then the set *D* is
   (a) $[x : 1 < x \leq 2]$ (b) $[x : 1 \leq x < 2]$
   (c) $[x : 1 \leq x \leq 2]$ (d) None of these

11. If the sets *A* and *B* are defined as $A = \{(x, y) : y = e^x, x \in R\}$; $B = \{(x, y) : y = x, x \in R\}$, then **[UPSEAT 1994, 99, 2002]**
   (a) $B \subseteq A$ (b) $A \subseteq B$
   (c) $A \cap B = \phi$ (d) $A \cup B = A$

12. If $X = \{4^n - 3n - 1 : n \in N\}$ and $Y = \{9(n-1) : n \in N\}$, then $X \cup Y$ is equal to
   (a) *X* (b) *Y*
   (c) *N* (d) None of these

13. Let $n(U) = 700, n(A) = 200, n(B) = 300$ and $n(A \cap B) = 100$, then $n(A^c \cap B^c) =$
   (a) 400 (b) 600
   (c) 300 (d) 200

14. In a town of 10,000 families it was found that 40% family buy newspaper *A*, 20% buy newspaper *B* and 10% families buy newspaper *C*, 5% families buy *A* and *B*, 3% buy *B* and *C* and 4% buy *A* and *C*. If 2% families buy all the three newspapers, then number of families which buy *A* only is **[Roorkee 1997]**
   (a) 3100 (b) 3300
   (c) 2900 (d) 1400

15. In a city 20 percent of the population travels by car, 50 percent travels by bus and 10 percent travels by both car and bus. Then persons travelling by car or bus is **[Kerala (Engg.) 2002]**
   (a) 80 percent (b) 40 percent
   (c) 60 percent (d) 70 percent

16. In a class of 55 students, the number of students studying different subjects are 23 in Mathematics, 24 in Physics, 19 in Chemistry, 12 in Mathematics

and Physics, 9 in Mathematics and Chemistry, 7 in Physics and Chemistry and 4 in all the three subjects. The number of students who have taken exactly one subject is **[UPSEAT 1990]**

(a) 6 (b) 9
(c) 7 (d) All of these

17. If A, B and C are any three sets, then $A \times (B \cup C)$ is equal to
(a) $(A \times B) \cup (A \times C)$ (b) $(A \cup B) \times (A \cup C)$
(c) $(A \times B) \cap (A \times C)$ (d) None of these

18. If A, B and C are any three sets, then $A - (B \cup C)$ is equal to
(a) $(A - B) \cup (A - C)$ (b) $(A - B) \cap (A - C)$
(c) $(A - B) \cup C$ (d) $(A - B) \cap C$

19. If A, B and C are non-empty sets, then $(A - B) \cup (B - A)$ equals **[AMU 1992, 1998; DCE 1998]**
(a) $(A \cup B) - B$ (b) $A - (A \cap B)$
(c) $(A \cup B) - (A \cap B)$ (d) $(A \cap B) \cup (A \cup B)$

20. If $A = \{2, 4, 5\},\ B = \{7,\ 8, 9\}$, then $n(A \times B)$ is equal to
(a) 6 (b) 9
(c) 3 (d) 0

21. If the set A has p elements, B has q elements, then the number of elements in $A \times B$ is **[Karnataka CET 1999]**
(a) $p+q$ (b) $p+q+1$
(c) pq (d) p^2

22. If $A = \{a, b\}, B = \{c, d\}, C = \{d, e\}$, then $\{(a,c),(a,d),(a,e),(b,c),(b,d),(b,e)\}$ is equal to **[AMU 1999; Him. CET 2002]**
(a) $A \cap (B \cup C)$ (b) $A \cup (B \cap C)$
(c) $A \times (B \cup C)$ (d) $A \times (B \cap C)$

23. If P, Q and R are subsets of a set A, then $R \times (P^c \cup Q^c)^c =$ **[Karnataka CET 1993]**
(a) $(R \times P) \cap (R \times Q)$ (b) $(R \times Q) \cap (R \times P)$
(c) $(R \times P) \cup (R \times Q)$ (d) None of these

24. In rule method the null set is represented by **[Karnataka CET 1998]**
(a) {} (b) ϕ
(c) $\{x : x = x\}$ (d) $\{x : x \neq x\}$

25. $A = \{x : x \neq x\}$ represents **[Kurukshetra CEE 1998]**
(a) {0} (b) {}
(c) {1} (d) $\{x\}$

26. If $Q = \left\{x : x = \frac{1}{y}, \text{where } y \in N\right\}$, then
(a) $0 \in Q$ (b) $1 \in Q$
(c) $2 \in Q$ (d) $\frac{2}{3} \in Q$

27. Which set is the subset of all given sets **[Pb. CET 2001]**
(a) {1, 2, 3, 4,......} (b) {1}
(c) {0} (d) {}

28. Let $S = \{0, 1, 5, 4, 7\}$. Then the total number of subsets of S is
(a) 64 (b) 32
(c) 40 (d) 20

29. The number of non-empty subsets of the set {1, 2, 3, 4} is **[Karnataka CET 1997; AMU 1998]**
(a) 15 (b) 14
(c) 16 (d) 17

30. The smallest set A such that $A \cup \{1, 2\} = \{1, 2, 3, 5, 9\}$ is
(a) {2, 3, 5} (b) {3, 5, 9}
(c) {1, 2, 5, 9} (d) None of these

31. If $A \cap B = B$, then **[JMIEE 2000]**
(a) $A \subset B$ (b) $B \subset A$
(c) $A = \phi$ (d) $B = \phi$

32. If A and B are two sets, then $A \cup B = A \cap B$ iff
(a) $A \subseteq B$ (b) $B \subseteq A$
(c) $A = B$ (d) None of these

33. Let A and B be two sets. Then
(a) $A \cup B \subseteq A \cap B$ (b) $A \cap B \subseteq A \cup B$
(c) $A \cap B = A \cup B$ (d) None of these

34. Let $A = \{(x, y) : y = e^x, x \in R\}$, $B = \{(x, y) : y = e^{-x}, x \in R\}$. Then
(a) $A \cap B = \phi$ (b) $A \cap B \neq \phi$
(c) $A \cup B = R^2$ (d) None of these

35. If $A = \{2, 3, 4, 8, 10\}$, $B = \{3, 4, 5, 10, 12\}$, $C = \{4, 5, 6, 12, 14\}$ then $(A \cap B) \cup (A \cap C)$ is equal to
(a) {3, 4, 10} (b) {2, 8, 10}
(c) {4, 5, 6} (d) {3, 5, 14}

36. If A and B are any two sets, then $A \cap (A \cup B)$ is equal to
(a) A (b) B
(c) A^c (d) B^c

37. If A, B, C be three sets such that $A \cup B = A \cup C$ and $A \cap B = A \cap C$, then **[Roorkee 1991]**
(a) $A = B$ (b) $B = C$
(c) $A = C$ (d) $A = B = C$

38. Let $A = \{a, b, c\}$, $B = \{b, c, d\}$, $C = \{a, b, d, e\}$, then $A \cap (B \cup C)$ is **[Kurukshetra CEE 1997]**

(a) $\{a, b, c\}$ (b) $\{b, c, d\}$

(c) $\{a, b, d, e\}$ (d) $\{e\}$

39. If A and B are sets, then $A \cap (B - A)$ is

(a) ϕ (b) A

(c) B (d) None of these

40. If A and B are two sets, then $A \cap (A \cup B)'$ is equal to

(a) A (b) B

(c) ϕ (d) None of these

41. Let $U = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$, $A = \{1, 2, 5\}, B = \{6, 7\}$, then $A \cap B'$ is

(a) B' (b) A

(c) A' (d) B

42. If A is any set, then

(a) $A \cup A' = \phi$ (b) $A \cup A' = U$

(c) $A \cap A' = U$ (d) None of these

43. If $N_a = [an : n \in N\}$, then $N_5 \cap N_7 =$ **[Kerala (Engg.) 2005]**

(a) N_7 (b) N

(c) N_{35} (d) N_5

(e) N_{12}

44. If $aN = \{ax : x \in N\}$, then the set $3N \cap 7N$ is

(a) 21 N (b) 10 N

(c) 4 N (d) None of these

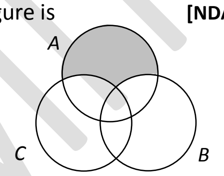
45. The shaded region in the given figure is **[NDA 2000]**

(a) $A \cap (B \cup C)$

(b) $A \cup (B \cap C)$

(c) $A \cap (B - C)$

(d) $A - (B \cup C)$



46. If A and B are two sets then $(A - B) \cup (B - A) \cup (A \cap B)$ is equal to

(a) $A \cup B$ (b) $A \cap B$

(c) A (d) B'

47. Let A and B be two sets then $(A \cup B)' \cup (A' \cap B)$ is equal to

(a) A' (b) A

(c) B' (d) None of these

48. Let U be the universal set and $A \cup B \cup C = U$. Then $\{(A - B) \cup (B - C) \cup (C - A)\}'$ is equal to

(a) $A \cup B \cup C$ (b) $A \cup (B \cap C)$

(c) $A \cap B \cap C$ (d) $A \cap (B \cup C)$

49. If $n(A) = 3$, $n(B) = 6$ and $A \subseteq B$. Then the number of elements in $A \cup B$ is equal to

(a) 3 (b) 9

(c) 6 (d) None of these

50. Let A and B be two sets such that $n(A) = 0.16, n(B) = 0.14, n(A \cup B) = 0.25$. Then $n(A \cap B)$ is equal to **[JMIEE 2001]**

(a) 0.3 (b) 0.5

(c) 0.05 (d) None of these

51. If A and B are disjoint, then $n(A \cup B)$ is equal to

(a) $n(A)$ (b) $n(B)$

(c) $n(A) + n(B)$ (d) $n(A).n(B)$

52. If A and B are not disjoint sets, then $n(A \cup B)$ is equal to **[Kerala (Engg.) 2001]**

(a) $n(A) + n(B)$ (b) $n(A) + n(B) - n(A \cap B)$

(c) $n(A) + n(B) + n(A \cap B)$ (d) $n(A)n(B)$

(e) $n(A) - n(B)$

53. In a battle 70% of the combatants lost one eye, 80% an ear, 75% an arm, 85% a leg, x% lost all the four limbs. The minimum value of x is

(a) 10 (b) 12

(c) 15 (d) None of these

54. Out of 800 boys in a school, 224 played cricket, 240 played hockey and 336 played basketball. Of the total, 64 played both basketball and hockey; 80 played cricket and basketball and 40 played cricket and hockey; 24 played all the three games. The number of boys who did not play any game is **[DCE 1995; MP PET 1996]**

(a) 128 (b) 216

(c) 240 (d) 160

55. A survey shows that 63% of the Americans like cheese whereas 76% like apples. If x% of the Americans like both cheese and apples, then

(a) $x = 39$ (b) $x = 63$

(c) $39 \le x \le 63$ (d) None of these

56. 20 teachers of a school either teach mathematics or physics. 12 of them teach mathematics while 4 teach both the subjects. Then the number of teachers teaching physics only is

(a) 12 (b) 8

(c) 16 (d) None of these

57. Of the members of three athletic teams in a school 21 are in the cricket team, 26 are in the hockey team and 29 are in the football team. Among them, 14 play hockey and cricket, 15 play hockey and football, and 12 play football and cricket. Eight play all the three games. The total number of members in the three athletic teams is

(a) 43 (b) 76
(c) 49 (d) None of these

58. In a class of 100 students, 55 students have passed in Mathematics and 67 students have passed in Physics. Then the number of students who have passed in Physics only is **[DCE 1993; ISM Dhanbad 1994]**
(a) 22 (b) 33
(c) 10 (d) 45

59. If A and B are two sets, then $A \times B = B \times A$ iff
(a) $A \subseteq B$ (b) $B \subseteq A$
(c) $A = B$ (d) None of these

60. If A and B be any two sets, then $(A \cap B)'$ is equal to
(a) $A' \cap B'$ (b) $A' \cup B'$
(c) $A \cap B$ (d) $A \cup B$

61. Let A and B be subsets of a set X. Then
(a) $A - B = A \cup B$ (b) $A - B = A \cap B$
(c) $A - B = A^c \cap B$ (d) $A - B = A \cap B^c$

62. Let A and B be two sets in the universal set. Then $A - B$ equals
(a) $A \cap B^c$ (b) $A^c \cap B$
(c) $A \cap B$ (d) None of these

63. If A, B and C are any three sets, then $A - (B \cap C)$ is equal to
(a) $(A - B) \cup (A - C)$ (b) $(A - B) \cap (A - C)$
(c) $(A - B) \cup C$ (d) $(A - B) \cap C$

64. If A, B, C are three sets, then $A \cap (B \cup C)$ is equal to
(a) $(A \cup B) \cap (A \cup C)$ (b) $(A \cap B) \cup (A \cap C)$
(c) $(A \cup B) \cup (A \cup C)$ (d) None of these

65. If $A = \{1, 2, 4\}$, $B = \{2, 4, 5\}$, $C = \{2, 5\}$, then $(A - B) \times (B - C)$ is
(a) $\{(1, 2), (1, 5), (2, 5)\}$ (b) $\{(1, 4)\}$
(c) $(1, 4)$ (d) None of these

66. If (1, 3), (2, 5) and (3, 3) are three elements of $A \times B$ and the total number of elements in $A \times B$ is 6, then the remaining elements of $A \times B$ are
(a) (1, 5); (2, 3); (3, 5) (b) (5, 1); (3, 2); (5, 3)
(c) (1, 5); (2, 3); (5, 3) (d) None of these

67. $A = \{1, 2, 3\}$ and $B = \{3, 8\}$, then $(A \cup B) \times (A \cap B)$ is
(a) $\{(3, 1), (3, 2), (3, 3), (3, 8)\}$
(b) $\{(1, 3), (2, 3), (3, 3), (8, 3)\}$
(c) $\{(1, 2), (2, 2), (3, 3), (8, 8)\}$
(d) $\{(8, 3), (8, 2), (8, 1), (8, 8)\}$

68. If $A = \{2, 3, 5\}$, $B = \{2, 5, 6\}$, then $(A - B) \times (A \cap B)$ is
(a) $\{(3, 2), (3, 3), (3, 5)\}$ (b) $\{(3, 2), (3, 5), (3, 6)\}$
(c) $\{(3, 2), (3, 5)\}$ (d) None of these

69. In a class of 30 pupils, 12 take needle work, 16 take physics and 18 take history. If all the 30 students take at least one subject and no one takes all three then the number of pupils taking 2 subjects is
(a) 16 (b) 6
(c) 8 (d) 20

70. If $n(A) = 4$, $n(B) = 3$, $n(A \times B \times C) = 24$, then $n(C) =$ **[Kerala (Engg.) 2005]**
(a) 288 (b) 1
(c) 12 (d) 17
(e) 2

71. The number of elements in the set $\{(a, b) : 2a^2 + 3b^2 = 35, a, b \in Z\}$, where Z is the set of all integers, is **[Kerala (Engg.) 2005]**
(a) 2 (b) 4
(c) 8 (d) 12
(e) 16

72. If $A = \{1, 2, 3, 4\}$; $B = \{a, b\}$ and f is a mapping such that $f : A \to B$, then $A \times B$ is
(a) $\{(a, 1), (3, b)\}$
(b) $\{(a, 2), (4, b)\}$
(c) $\{(1, a), (1, b), (2, a), (2, b), (3, a), (3, b), (4, a), (4, b)\}$
(d) None of these

73. If $A = \{1, 2, 3, 4, 5\}$, $B = \{2, 4, 6\}$, $C = \{3, 4, 6\}$, then $(A \cup B) \cap C$ is **[Orissa JEE 2004]**
(a) $\{3, 4, 6\}$ (b) $\{1, 2, 3\}$
(c) $\{1, 4, 3\}$ (d) None of these

74. If $A = \{x, y\}$ then the power set of A is **[Pb. CET 2004, UPSEAT 2000]**
(a) $\{x^x, y^y\}$
(b) $\{\phi, x, y\}$
(c) $\{\phi, \{x\}, \{2y\}\}$
(d) $\{\phi, \{x\}, \{y\}, \{x, y\}\}$

75. A set contains $2n+1$ elements. The number of subsets of this set containing more than n elements is equal to **[UPSEAT 2001, 04]**
(a) 2^{n-1} (b) 2^n
(c) 2^{n+1} (d) 2^{2n}

76. Which of the following is a true statement **[UPSEAT 2005]**
(a) $\{a\} \in \{a, b, c\}$ (b) $\{a\} \subseteq \{a, b, c\}$

(c) $\phi \in \{a, b, c\}$ (d) None of these

77. If A = {x : x is a multiple of 4} and B = {x : x is a multiple of 6} then $A \subset B$ consists of all multiples of **[UPSEAT 2000]**

(a) 16 (b) 12

(c) 8 (d) 4

78. A class has 175 students. The following data shows the number of students obtaining one or more subjects. Mathematics 100, Physics 70, Chemistry 40; Mathematics and Physics 30, Mathematics and Chemistry 28, Physics and Chemistry 23; Mathematics, Physics and Chemistry 18. How many students have offered Mathematics alone

[Kerala (Engg.) 2003]

(a) 35 (b) 48

(c) 60 (d) 22

(e) 30

79. Consider the following relations :

(1) $A - B = A - (A \cap B)$

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

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

which of these is/are correct **[NDA 2003**

(a) 1 and 3 (b) 2 only

(c) 2 and 3 (d) 1 and 2

80. If two sets A and B are having 99 elements in common, then the number of elements common to each of the sets $A \times B$ and $B \times A$ are

(a) 2^{99} (b) 99^{2}

(c) 100 (d) 18

(e) 9

81. Given $n(U) = 20$, $n(A) = 12$, $n(B) = 9$, $n(A \cap B) = 4$, where U is the universal set, A and B are subsets of U, then $n((A \cup B)^{C}) =$

(a) 17 (b) 9

(c) 11 (d) 3

(e) 16

Answers

1	d	2	b	3	a	4	c	5	c
6	b	7	a	8	d	9	c	10	b
11	c	12	b	13	c	14	b	15	c
16	d	17	a	18	b	19	c	20	b
21	c	22	c	23	a,b	24	d	25	b
26	b	27	d	28	b	29	a	30	b
31	b	32	c	33	b	34	b	35	a
36	a	37	b	38	a	39	a	40	c
41	b	42	b	43	c	44	a	45	d
46	a	47	a	48	c	49	c	50	c
51	c	52	b	53	a	54	d	55	c
56	a	57	a	58	d	59	c	60	b
61	d	62	a	63	a	64	b	65	b
66	a	67	b	68	c	69	a	70	e
71	c	72	c	73	a	74	d	75	d
76	a	77	b	78	c	79	d	80	b
81	d								