

**Class: XI**  
**Subject: Maths**  
**Topic: Sets, Relation, Functions and Logarithms**  
**No. of Questions: 21**

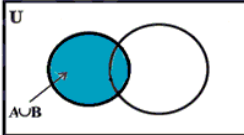
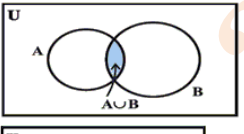
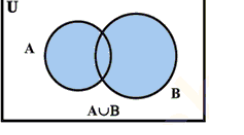
Q1. Which of the following is a set?

- A. Collection of all the intelligent students of a given class
- B. Collection of all the beautiful girls in given locality
- C. Collection of all the grounds on which Sachin has made a century
- D. Collection of all the talented cricketers of India

Q2. Which of the following operations is not a valid operation in set theory?

- A. Union of two sets
- B. Intersection of two sets
- C. Difference of two sets
- D. None of these

Q3. Which of the following diagrams correctly represents union of two sets A & B?

- A. 
- B. 
- C. 
- D. None of these

Q4. When are two sets equal?

- A. If they have same number of members.
- B. If they have same members.
- C. If they have members of same nature.
- D. None of these

Q5. In a group of 50 persons, everyone takes either tea or coffee. If 35 take tea and 25 take coffee, then the number of persons who take both tea and coffee is

- A. 10
- B. 25
- C. 35
- D. 60

Q6. Match the following:

p. Natural numbers (N)	a. {1, 2, 3, ...}
q. Whole numbers (W)	b. Integers – negative integers
r. Rational numbers (Q)	c. $N \cup W \cup \text{Integers} \cup Q$
s. Real numbers (R)	d. $W \cup \text{integers} \cup \text{fractions}$

- A. p - b, q - a, r - d, s - c
- B. p - b, q - a, r - c, s - d
- C. p - a, q - b, r - d, s - c
- D. none of these

Q7. If set  $A = \{3, 15, 4, 7\}$  and if we denote each element of set a as 'n' then, which of the following sets represents the elements of the type ' $2n + 1$ '

- A. {7, 61, 9, 15}
- B. {7, 9, 15, 31}
- C. (7, 61, 9, 15)
- D. {7, 31, 15, 29}

Q8. In a town, 48% people are educated, 51% people are young and 60% are servicemen. 24% are educated and young, 25% are young and servicemen, 27% are educated and servicemen and 5% have all the qualities. If the total number of persons in this town is 300, what is the ratio of those who have exactly two characteristics and those who have only one characteristic?

- A.  $\frac{31}{22}$   
B.  $\frac{47}{61}$   
C.  $\frac{61}{47}$   
D. None of these

Q9. In a town, 48% people are educated, 51% people are young, 60% are servicemen, 24% are educated and young, 25% are young and servicemen, 27% are educated and servicemen and 5% have all three characteristics. How many people (in percentage terms) do not have any of these three characteristics?

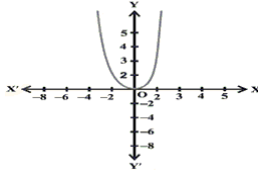
- A. 12%  
B. 0%  
C. 9%  
D. None of these

Q10. Which of the following statements are false?

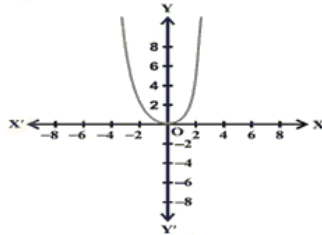
- a. Every function is a relation but every relation is not a function  
b. Every relation is a function but every function is not a relation  
c. There is no relation between functions and relations.  
d. Function is just another name of relation.

- A. a, c and d  
B. a, b and d  
C. b, c and d  
D. a, b and c

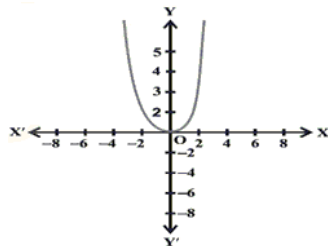
Q11. Which of the following is/are graph(s) of  $f(x) = x^2$ ?



A.



B.



C.

D. All of the above

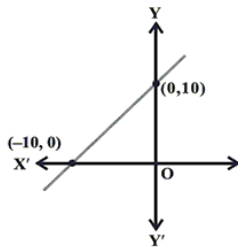
Q12. Let A and B be two given sets, then in order to define a relation on these two sets which of the following must hold?

- A. Relation can be defined between any two sets
- B. One of them should be non-empty
- C. Both of them should be non-empty
- D. There must be some connection between these two sets

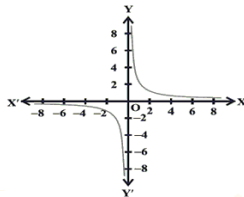
Q13. If P and Q are two non-empty sets, then which of the following statements defines cartesian product most appropriately?

- A.  $P \times Q = \{(p, q) : p \in P, q \in Q\}$
- B.  $P \times Q = \{p \times q : p \in P, q \in Q\}$
- C.  $P \times Q = \{p q : p \in P, q \in Q\}$
- D.  $P \times Q = \{(q, p) : p \in P, q \in Q\}$

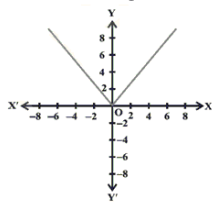
Q14. Which of the following graphs will give all the real numbers as its values?



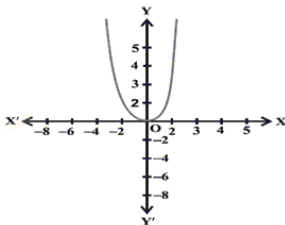
A.



B.



C.



D.

Q15. Which of the following is true?

- A. If we draw a line parallel to y-axis then it can cut the graph of a function at atmost 2 points
- B. If we draw a line parallel to y-axis then it can cut the graph of a function at atmost 1 point
- C. If we draw a line parallel to x-axis then it can cut the graph of a function at atmost 1 point
- D. All of the above are true

Q16. The value of  $2 \log \frac{5}{3} - \log \frac{7}{4} + 2 \log 3 + \frac{1}{2} \log 49$  is

- A.  $\log 2$
- B. 0
- C. 2
- D. 3

Q17. The possible value(s) of  $x$  for the equation  $\log_2 x^2 + \log_x 2 = 3$  is/are

- A.  $2, \sqrt{2}$
- B.  $1 \pm \sqrt{2}$
- C.  $1, \sqrt{2}$
- D.  $2 \pm \sqrt{2}$

Q18. If  $\log(a - b) = \log a - \log b$ , then find  $a$  in terms of  $b$ .

- A.  $\frac{b^2}{b-1}$
- B.  $\frac{b^2}{b+1}$
- C.  $\frac{b}{b^2 + 1}$
- D. None of these

Q19.  $\log_3 x - \log_x 27 < 2$  for any  $x$  in

- A.  $(\frac{1}{3}, 27)$
- B.  $(\frac{1}{27}, 3)$
- C.  $(\frac{1}{9}, 9)$
- D. None of these

Q20.  $0.2^{\log_{\sqrt{5}}\left(\frac{1}{4} + \frac{1}{8} + \frac{1}{16} + \dots \infty\right)}$

- A. 2
- B. 4
- C. 1
- D. None of these

Q21. If  $(\log_e x)^2 - 5 \log_e x + 6 = 0$ , then the value(s) of x could be

- A. 2
- B.  $e^2$
- C.  $e^3$
- D. Both (2) and (3)

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