INDIAN SCHOOL AL WADI AL KABIR

Class XI, Mathematics Revision worksheet

MCQ/Assertion-Reasoning/Case study Questions

18-09-2023

SECTION A

Q.1. *Which of the following represents* $-1 \leq x < 5$?

A $(-1, 5)$ **B** $[-1, 5)$ **C** $[-1, 5]$ **D** $(-1, 5]$

Q.2. Given: For two finite sets A and B, n(A-B) = 10+x, n(B – A) = 3x and n(A∩ *B*)= x+1. If n(A) = n(B), then n(A).

A 5 **B** 16 **C** 21 **D** 15

Q.3. The roster form of the set $A = \{x: x = n^2 + 1, n \in N, n \leq 5\}$

A $\{2, 5, 10, 17, 26\}$ **B** $\{5, 10, 17, 26\}$ *C* $\{2, 5, 10, 17, 26....\}$ **D** $\{2, 5, 10, 17, 26, 37\}$

Q.4. *Which of the following are disjoint sets*?

A Set of natural numbers, set of whole numbers **B** Set of integers, set of rational numbers

C Set of whole numbers, set of prime numbers **D** Set of odd numbers, set of even numbers

Q.5. In a class of 70 students, 30 students play cricket and 20 students play tennis, and 10 students play both the games. Then, the number of students who play neither is

A 10 **B** 20 **C** 30 **D** 40

Q6 *The domain of* $\dfrac{2x+1}{x^2-5x+4}$

A R **B** $R - \{1, 4\}$ **C** R-{-1, -4} **D** $[1, 4]$

Q7 If $A \times B = \{(0,2)(1,2), (3,2)(0,1), (1,1), (3,1)\}$ *then the set* $B =$

A $\{1, 2\}$ **B** $\{0, 1, 3\}$ **C** $\{0, 1, 2, 3\}$ **D** $[1, 2]$

Q8 A= $\{0, 1, 2,3, 4\}$, B =$\{-2, -1, 0, 1, \ldots, 10\}$*and* R = $\{(0. -2), (1. 0), (2, 2), (3, 4)(4, 6)\}$. Which of the following is correct?

A R=$\{(x, y): y = x - 2, x\epsilon A, y\epsilon B\}$ **B** $R = \{(x, y): y = 2x + 2, x\epsilon A, y\epsilon B\}$

C $R = \{(x, y): y = 2x - 2, x\epsilon A, y\epsilon B\}$ **D** $R = \{(x, y): x = 2y + 2, x\epsilon A, y\epsilon B\}$

Q9 *If for two sets A and B, $n(A) = 3$ and $n(B) = 3$, then number of relations from B to A*

A 6 **B** 9 **C** 8 **D** 64

Q10 If $z = \frac{1+i}{1-i}$, *then mutiplicative inverse of* z

A $1 + i$ **B** $-i$ **C** i **D** $1 - i$

Q11 Solution of $x^2 + 1 = 0$

A $\pm i$ **B** $1 \pm i$ **C** $-2 \pm 2i$ **D** $\frac{1 \pm i}{2}$

Q12 *Evaluate*: $1 + i^2 + i^4 + i^6 + \ldots\ldots + i^{100}$

A 0 **B** -1 **C** 1 **D** i

Q13 The standard form of $(1 + i)^3$

A $-2 + 2i$ **B** $2 - 2i$ **C** $2 - 3i$ **D** $3 - 2i$

Q14 *If* $\left(\frac{2a-3}{5}, a + 2b\right) = (1, 2)$, *then values of* a *and* b.

A $a = -4, b = 1$ **B** $a = 4, b = -1$ **C** $a = -4, b = -1$ **D** $a = 4, b = 1$

Q15 Which of the following relations are functions?

i) {(1, 2), (2, 2), (3, 2), (4, 2), (2, 4)}
ii) {(3, 5), (4, 7), (5, 8), (6, 10), (7,12)}
iii) {(2, 1), (2, 2), (3, 1), (4, 2), (5, 2)}
iv) {(a, 1), (a, 2), (a, 3), (a, 4)}

A *ii* B I and *ii* **C** *i, ii, iii and iv* **D** *none of these*

Q16 Range of the function $f(x) = \frac{x^2}{x^2+1}$

A $\{0, 1\}$ B $[0, 1]$ **C** $[0, 1)$ **D** $(0, 1]$

Q17 The domain and range of the function $f(x) = \sqrt{1 - x^2}$

A Domain: [0, 1] Range: [0, 1]

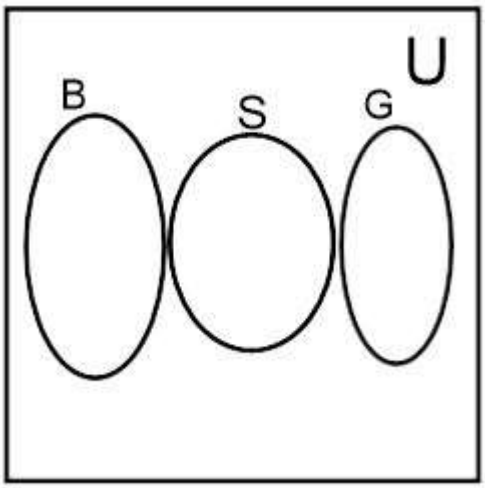
B Domain: [-1, 1] Range: [0, 1]

C Domain: {0, 1} Range: {0, 1}

D Domain: {-1, 1} Range: {0, 1}

Q18 Let U be the set of all boys and girls in a school. G be the set of all girls, B be the set of all boys and S be the set of all students who take swimming. Some but not all students in the school take swimming. Which of the following Venn diagram shows one of the possible relationships among the sets U, B, G and S.

A



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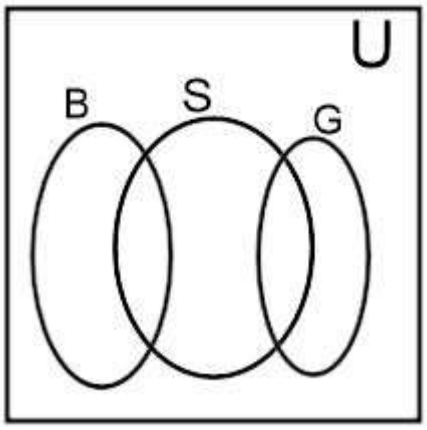

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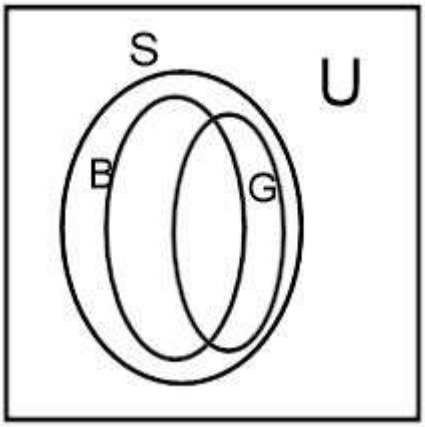

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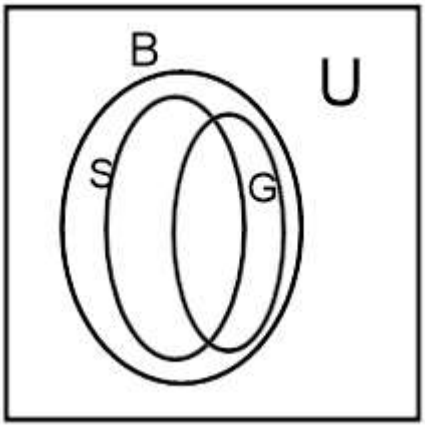


Q19 $If\ A = \{2, 3, 5, 7\}, B = \{2, 4, 6, 8, 10\} and\ C = \{1, 5, 10\},$
$then\ (A - B) U (B - C)$

A $\{2, 4, 6, 8, 10\}$ B $\{1, 2, 5, 4, 6, 8, 10\}$ **C** $\{1, 2, 3, 4, 5, 6\}$ **D** $\{2, 3, 4, 5, 6, 7, 8\}$

Q20

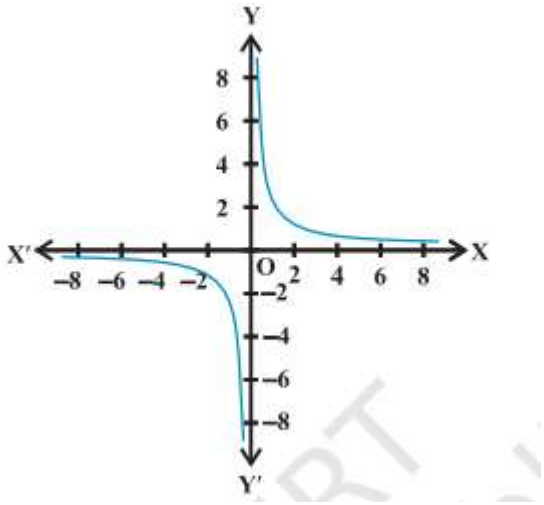
The real values of x *and* y *if* $(x - iy)(3 + 2i)$ *is the conjugate of* $12 + 5i$

A $x = 2, y = -3$ B $x = -2, y = -3$ **C** $x = -2, y = 3$ **D** $x = 2, y = 3$

Q21

Obseve the figure given graph.

Which of the following is true?



A $f(x) = \frac{1}{x}, f: R - \{0\} \to R - \{0\}$ **B** $f(x) = [x], f: R \to Z$

C $f(x) = x^2, f: R - \{0\} \to R - \{0\}$ **D** $f(x) = x^3, f: R - \{0\} \to R - \{0\}$

Q22. If $z = 3 + 4i, then\ z.\bar{z}$

A 7 B 12 **C** 25 **D** -7

Q23.

$$If\ f(x) = \begin{cases} 3x - 1, & 0 \le x < 3 \\ 2x + 1, & 3 \le x < 5 \\ x^2 - 10, & 5 \le x < 8 \end{cases}, x \in W, then\ f(0) + f(4) + f(5)$$

A 25 B 23 **C** 19 **D** -10

Q24. If N, Z, Q, Rand C represent the set of natural numbers, integers, rational numbers, real numbersand complex numbers respectively, which of the following is true?

A $N \subset Z \subset R \subset Q \subset C$ **B** $N \subset Z \subset Q \subset R \subset C$

C $N \subset Z \subset C \subset Q \subset R$ **D** $N \subset Z \subset Q \subset C \subset R$

Q25. For two distinct positive numbers a and b, which of the following is always true ?

A $a + b > 2\sqrt{ab}$ B $\frac{a+b}{2} > ab$ **C** $\sqrt{ab} > \frac{a+b}{2}$ **D** $\frac{2ab}{a+b} > \sqrt{ab}$

Q26 How many two digit numbers are there with distinct digits?

A 81 B 90 C 99 D 64

Q27 How many distinct triangles can be formed using 10 non-collinear points?

A 90 B 120 C 28 D 45

Q28 Evaluate: $20C_{13} + 20C_{14} - 20C_6 - 20C_{7,}$

A 20 B 40 C 0 D 400

Q29 A convex polygon has 27 diagonals. Find the number of sides

A 8 B 9 C 10 D 12

ASSERTION-REASON BASED QUESTIONS

In the following questions (19 and 20), a statement of assertion (A) is followed by a statement of Reason (R). Choose the correct answer out of the following choices.

A) Both A and R are true and R is the correct explanation of A.

B) Both A and R are true but R is not the correct explanation of A.

C) A is true but R is false.

D) A is false but R is true.

Q30 (A) If the set A has 5 elements, then number of sumbsets of A = 32.

(R) $If\ a\ set\ has\ n\ elements, then\ number\ of\ subsets = n^2$.

Q31 (A) $\{(1,2),(2,,2),(3,2),(4,2)\}\ is\ a\ function$.

(R) All functions are relations.

Q32 (A) Sinx =2, then x=$\frac{5\pi}{6}$.

(R) $-1 \leq sinA \leq 1$

Q33 (A) $i^{10} = 1$

(R) The conjugate of a complex number is a complex number.

Q34 (A) $sin105° + cos165° = 0$

(R) SinA + cosA =0 if A$\in$ $II\ quadrant$.

Q35 (A) If C(n, 2)= C(n, 8), then n= 10

(R) If C(n, a)= C(n, b) then a= b or a+b =n

Q36 Sherlin and Danju are playing Ludo at home during Covid-19. While rolling the dice, Sherlin's sister Raji observed and noted the possible outcomes of the throw every time belongs to set {1,2,3,4,5,6}. Let A be the set of players while B be the set of all possible outcomes.

i) Let R: B to B defined by R= {(x, y): y is divisible by x} Write R in roster form
ii) Raji wants to know the number of relations from A to B. How many relations are possible?
iii) Consider the relation given in (i) . Is R a function? Why?

Q37 Hari visited an exhibition along with his family. The exhibition had a huge swing. Hari found that the swing traced the path of a Parabola as given by $f(x) = x^2 + 1$

Answer the following questions based on the above informations

a. Given: $f(x) = x^2 + 1$, $f: R \to R$. Evaluate f(2)+ f(3)
b. If $f(x) = x^2 + 1, f: \{1, 2, 3, 4, \ldots\} \to X$, then write the range f .
c. *If* $f(x) = x^2 + 1$, *Write domain and range of* f

OR

Write domain and range of the function g(x) =$\sqrt{2 - x}$.

Q38 A state cricket authority has to choose a team of 11 members, to do it so the authority asks 2 coaches of a government academy to select the team members that have experience as well as the best performers in last 15 matches. They can make up a team of 11 cricketers amongst 15 possible candidates.

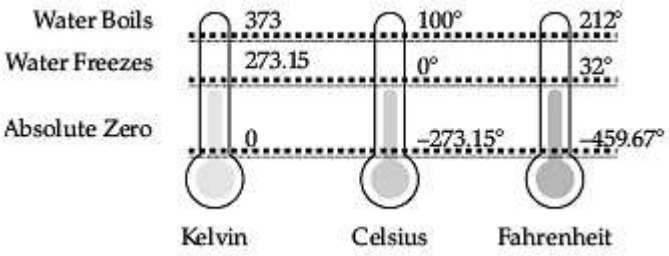
In how many ways can the final eleven be selected from 15 cricket players if:

i) there is no restriction

ii) one of them, who is in bad form, must always be excluded

iii) Two of them being leg spinners, one and only one leg spinner must be included.

39. Kelvin (K), degree Celsius (^{0}C) and degree Fahrenheit(^{0}F) are three units of temperature. The conversion formula for them as follows: $F = \frac{9}{5}C + 32 \; and \; K = C + 273.15$



i) When $F = 104^0$ then C= __

ii) When C= 60^0 then F=_____

iii) If a material is to kept in between 68^0 F and 77^0F, find the corresponding range of C.

Q40 Five kids A, B, C, D and E are sitting in a playground in a line.

Answer the following questions:

i) How many ways of sitting arrangement are there for these five kids?

ii) Find the total number of arrangement if A and B are sitting always together.

iii) Find the total number of arrangements if A, B and C are always together .

Answer Key

Q. No	Answer	Q No.	Ans	Q No.	Ans	Q. No	Ans
1	**B**	**11**	**A**	**21**	**A**	**31**	**B**
2	**C**	**12**	**C**	**22**	**C**	**32**	**C**
3	**A**	**13**	**A**	**23**	**B**	**33**	**D**
4	**D**	**14**	**B**	**24**	**B**	**34**	**D**
5	**D**	**15**	**A**	**25**	**A**	**35**	**A**
6	**B**	**16**	**C**	**26**	**A**		
7	**A**	**17**	**B**	**27**	**B**		
8	**C**	**18**	**B**	**28**	**C**		
9	**D**	**19**	**D**	**29**	**B**		
10	**B**	**20**	**D**	**30**	**C**		
36	$R = \{(1,1)(1,2),(1,3)(1,4),(1,5),(1,6),(2,2),,(2,4),(2,6),(3,3),(3,6),(4,4),(5,5),(6\ 6)\}$						
	Number of relation =2^{12} R is not a function						
37	**i) 5+10=15** **ii) {2, 5, 10, …}** **iii)** $\boldsymbol{R \rightarrow [1,\infty)}$ $\boldsymbol{OR}$ $\boldsymbol{(-\infty,2] \rightarrow [0,\infty)}$						
38	**I) C(15, 11) ii) C(14, 10) iii) C(2, 1). C(13, 11)**						
39	**i) 40 ii) 140 iii)** $\boldsymbol{20^{\circ} < C < 25}$						
40	**i) 120 ii) 48 iii) 24**						

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