Q.1. *The distance between $A(0, 2, 4)$ and $B(3, -2, -1)$ is____*

A	50	B	$5\sqrt{2}$	C	10	D	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 30 students play cricket and 20 students play tennis, and 10 students play both the games. If 40 students play neither cricket nor tennis, then the number of students in the class is _____.

A	110	B	100	C	90	D	80

Q6 *If $A(0, 2, 4), B(3, -4, -1)$ and P is a point on AB such that AP: PB= 2:1, the P lies in ____ octant.*

A	*I*	B	*II*	C	III	D	*IV*

Q7 *If $f(x) = x^{100} + x^{99} + x^{98} + \cdots x^2 + x + 1,$ then $f'(1) =$*

A	5050	B	5051	C	10000	D	100

Q8 A= {0, 1, 2,3, 4}, B ={−2, −1, 0, 1, … ,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, xϵA, yϵB}	B	$R = \{(x,y): y = 2x + 2, xϵA, yϵB\}$
C	$R = \{(x,y): y = 2x − 2, xϵA, yϵB\}$	D	$R = \{(x,y): x = 2y + 2, xϵA, yϵB\}$

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	The focus of the parabola $x^2 = 4y$ is ___						
	A	$(0, 1)$	B	$(0, 4)$	C	$(0, -1)$	D	$(1, 0)$

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	Which of the following is a GP?						
	A	2, 4, 6, 8......	B	3, 6, 10, 15, ...	C	100, 50, 25, 12.5, ...	D	9, 99, 999, 9999,...

Q15	In an AP, m times m^{th} term is equal to n times n^{th} term. Then $(m+n)^{th}$ term is						
	A	a_{m+n}	B	$m + n$	C	mn	D	0

Q16	The AM and GM of two positive numbers is 8 and 5 respectively. Then the corresponding quadratic equation is						
	A	$x^2 - 8x + 5 = 0$	B	$x^2 - 16x + 25 = 0$	C	$x^2 + 8x + 5 = 0$	D	$x^2 + 16x + 25 = 0$

Q17	Which of the following represents equation of an ellipse?						
	A	$x^2 + 4y^2 = 4$	B	$x^2 - 4y^2 = 4$	C	$x^2 + y^2 = 4$	D	$x + y = 4$

Q18	The sum of first 10 terms of series: $1 + \frac{1}{2} + \frac{1}{4} + \frac{1}{8} + \cdots$.							
	A	$\frac{1023}{1024}$	B	$\frac{1023}{512}$	C	$\frac{1}{1023}$	D	$\frac{512}{1023}$

Q19	The sum of n terms of the series: $s_n = 3 + 33 + 333 + 333 + \cdots + n^{th}$ term.		
	A	$\frac{1}{3}\left[\frac{10(10^n - 1)}{9} - n\right]$	B	$\left[\frac{10(10^n - 1)}{9} - n\right]$
	C	$3\left[\frac{10(10^n - 1)}{9}\right]$	D	$\left[\frac{10(10^n - 1)}{9}\right]$

Q20	The sum of $(m + n)^{th}$ and $(m - n)^{th}$ terms of an A.P. is equal to		
	A	twice the mth term.	B	thrice the mth term
	C	twice the $(m + n)^{th}$ term	D	twice the $(m - n)^{th}$ term

Q21	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	$a = 4, b = 1$

Q22	The distance between the lines x+y= 1 and 3x+ 3y = 1 is _____							
	A	$\frac{\sqrt{2}}{3}$	B	$\frac{2}{3}$	C	$2\sqrt{3}$	D	none of these

Q23	$\lim\limits_{x \to 1} \frac{x^{10} - 1}{x - 1} =$ _____							
	A	1	B	10	C	0	D	-1

Q24	The domain and range of the function $f(x) = \sqrt{16 - x^2}$							
	A	Domain: [0, 4] Range: [0, 4]	B	Domain: [-4, 4] Range: [0, 4]	C	Domain: {0, 4} Range: {0, 4}	D	Domain: {-4, 4} Range: {0, 4}

Q25	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		B	

C		D	
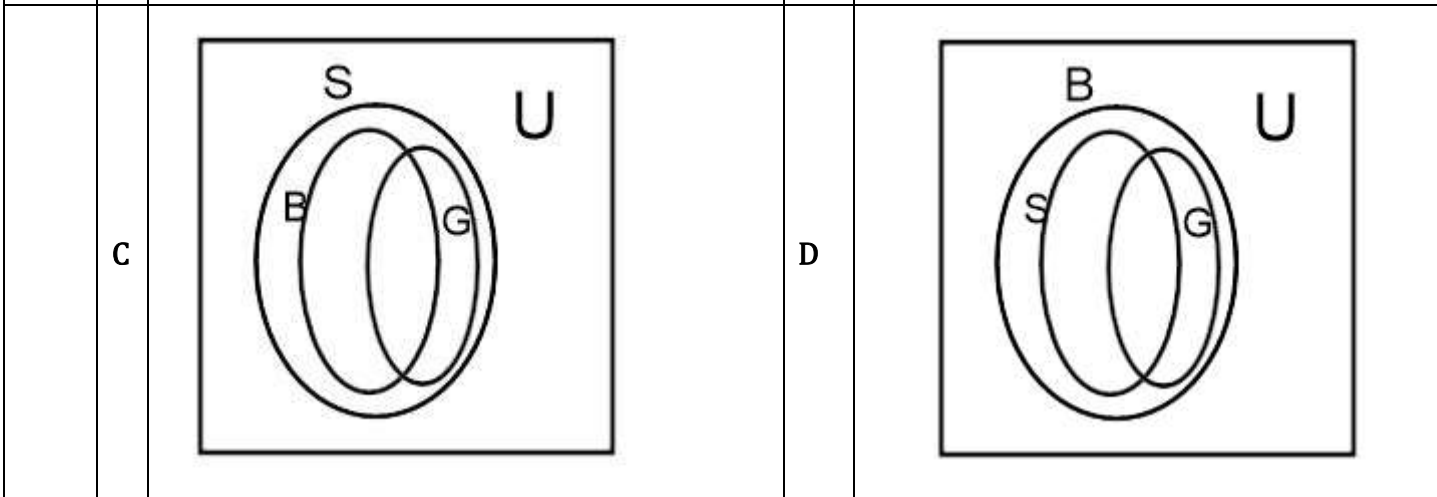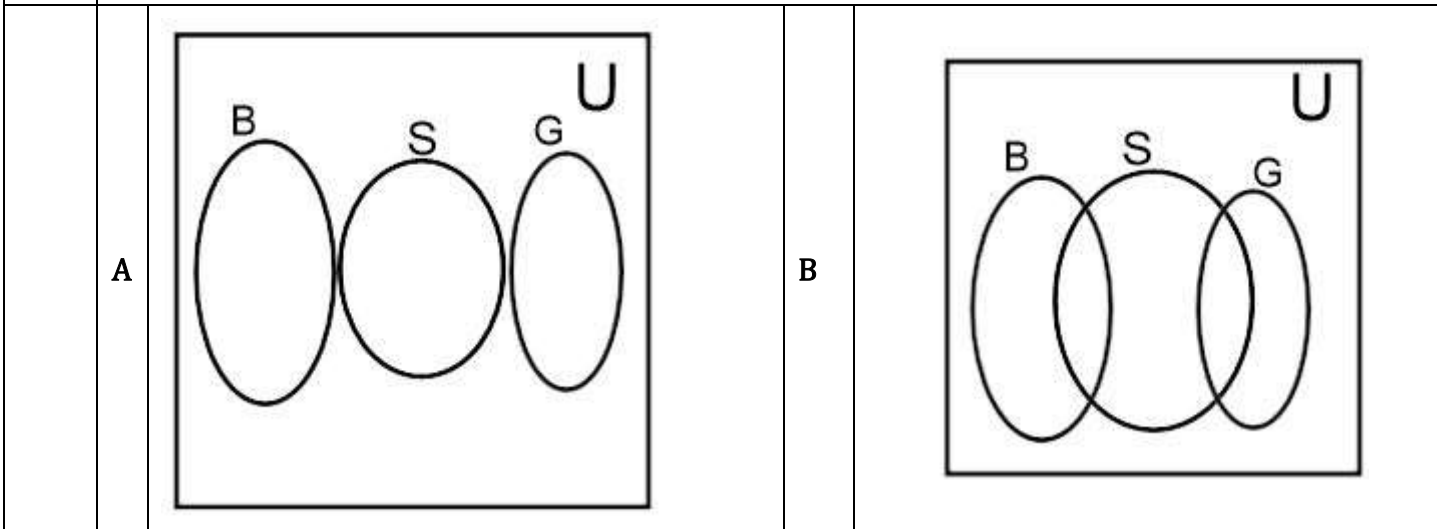
Q26	$If\ y\ =\ x^4 + x^3 + 3x + 1, then\ \dfrac{dy}{dx}\ at\ x = 1$

A	9	B	5	C	6	D	10

Q27	$The\ real\ values\ of\ x\ and\ y\ if\ (x - iy)\ (3\ +\ 2i)\ is\ the\ conjugate\ of\ 12 + 5i$

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

Q28	The number of ways of selection of a 6 member team with equal number of boys and girls from a group of 5 boys and 4 girls is _____.

A	40	B	20	C	36	D	200

Q29.	In a GP third term is 8 and 7th term is 128, then common ratio is _____						
	A	8	B	4	C	2	D	1

Q30.	The length of latus rectum for the curve $4x^2 - y^2 = 4$ is _____						
	A	4	B	8	C	2	D	1

Q31.	Which of the following equation represents a line passing through origin?		
	A	$x + y + 1 = 0$	B	$x = \sqrt{3}\, y$
	C	$2(x - 1) = 3y + 1$	D	$\dfrac{x}{3} + \dfrac{y}{4} = 1$

Q32.	For two distinct positive numbers a and b, which of the following is always true ?						
	A	$a + b > 2\sqrt{ab}$	B	$\dfrac{a+b}{2} > ab$	C	$\sqrt{ab} > \dfrac{a+b}{2}$	D	$\dfrac{2ab}{a+b} > \sqrt{ab}$

Q33	If one geometric mean p and two arithmetic means $q\ and\ r$ are inserted between two positive numbers, then $(2q - r)(2r - q)$ =						
	A	p^2	B	pqr	C	qr	D	q^2

Q34	If the ratio of sums of n terms of two arithmetic progressions is $3n - 2 : 2n + 1$, then the ratio of their 11th term						
	A	$31 : 23$	B	$61 : 43$	C	$4 : 3$	D	$28 : 21$

Q35	The product of three consecutive terms of a GP is $\frac{27}{8}$, then the middle term is						
	A	$\dfrac{27}{8}$	B	$\dfrac{81}{16}$	C	$\dfrac{3}{2}$	D	$\dfrac{9}{4}$

Q36	In a GP, 3rd term is 24 and 6th term is 192, then the first term .						
	A	8	B	6	C	4	D	2

Q37	$sin\dfrac{29\pi}{6} + cos\dfrac{31\pi}{3} =$						
	A	2	B	1	C	-1	D	0

Q38	The range of the function $|sinx + 1|$							
	A	$[1, 2]$	B	$[0, 2]$	C	$[-1, 1]$	D	R

Q39	$\dfrac{sinx + sin3x}{cosx + cos3x} = $ _____							
	A	Sin2x	B	$cos2x$	C	$tan2x$	D	$cot2x$

Q40	If $P(A) = \dfrac{1}{2}, P(B) = \dfrac{1}{3}$ and A and B are mutually exclusive, then $P(AUB) = $ ____							
	A	$\dfrac{1}{6}$	B	$\dfrac{5}{6}$	C	$\dfrac{1}{2}$	D	$\dfrac{2}{3}$

Q41	The total number of permutations of the word ' ALGEBRA' is							
	A	2520	B	720	C	5040	D	3960

Q42.	The solution of the inequality $|x + 1| \le 3$ is _____							
	A	$[0, 2]$	B	[-4, 2]	C	[-4, 0]	D	[1,4]

Q43	The coefficient of the middle term in the expansion of $(1 + 2x)^{10}$is _____							
	A	$10C_5(2)^5$	B	$2 \times 10C_5$	C	$10C_6(2)^6$	D	$10C_4(2)^6$

Q44.	If (0, -1) (-3, -7) and (4, k) are collinear, k =_____							
	A	9	B	6	C	7	D	-8

Q45.	Consider the random experiment of selecting a card from a pack of 52 cards. Let E be the event that the selected card is face card, F be the event that selected card is a black card, G be the event that the selected card is a king and H be the event that the selected card is an ace , then which of the events are mutually exclusive?							
	A	E and F	B	F and G	C	E and G	D	G and H

ASSERTION-REASON BASED QUESTIONS

In the following questions, 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

Q46. (A) $\lim\limits_{x\to 0}\dfrac{sin5x}{x}=5$ (R) $\lim\limits_{x\to 0}\dfrac{sinx}{x}=1$

Q47. (A) P(A) = 0.6, P(B) = 0.5 and P(A'UB')= 0.8 then P(AUB)= 0.8

(R) P(A or B) = P(A) + P(B) − P(A and B)

Q48 (A) $Equation\ of\ circle\ with\ centre\ (0,0)and\ radius\ 4\ units\ is\ x^2+y^2=16.$

(R) Diameter of a circle is twice its radius.

Q49. (A) 2x+3y =1 and 3x-2y =1 represents perpendicular lines

(R) If two lines are perpendicular, their slopes are equal.

Q50. (A) $75^0=\dfrac{\pi}{12}$ (R) $\pi\ radian=180°.$

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Answer Key

Q. No	Answer	Q No.	Ans	Q No.	Ans	Q. No	Ans	Q No	Ans
1	B	11	A	21	B	31	B	41	A
2	C	12	C	22	A	32	A	42	B
3	A	13	A	23	C	33	A	43	A
4	D	14	C	24	B	34	B	44	C
5	D	15	D	25	B	35	C	45	D
6	B	16	B	26	D	36	B	46	A
7	A	17	A	27	D	37	D	47	D
8	C	18	B	28	A	38	B	48	B
9	D	19	A	29	C	39	C	49	C
10	B	20	A	30	B	40	B	50	D

ALL THE BEST!