Question	The value of x in the equation: $16x + \frac{1}{x} = 8$ is	
Type	multiple_choice	
Option	¼,¼	correct
Option	⅛, ¼	incorrect
Option	¼, ⅛	incorrect
Option	⅛, ⅛	incorrect
Solution	$16x+\frac{1}{x}=8$ $\frac{16x^2+1}{x}=8$ $16x^2+1=8x$ $=>16x^2+1-8x=0$ $=>(4x-1)^2=0$ $=>x = \frac{1}{4},\frac{1}{4}$	
Marks	4	1

Question	The equation whose roots are 4 and 5, is
Type	multiple_choice

Option	$X^2+9x-20=0$	incorrect
Option	$x^2+9x+20=0$	incorrect
Option	$x^2-9x+20=0$	correct
Option	$x^2-9x-20=0$	incorrect
Solution	The required equation is: x^2-(sum of roots)x+product of roots=0 $\Rightarrow x^2-(4+5)x+4*5=0$ $\Rightarrow x^2-9x+20=0$	
Marks	4	1

Question	The roots of the equation $(x + 3) (x - 3) = 160$ are	
Type	multiple_choice	
Option	± 13	correct
Option	13,13	incorrect
Option	± 12	incorrect
Option	12,12	incorrect
Solution	$(x + 3) (x - 3) = 160$ $X^2 - 9 = 160$ $x^2 = 169$ $x = +13, - 13$	
Marks	4	1

Question	The solution of $\frac{2x+3}{2x-1} = \frac{3x-1}{3x+1}$ is	
Type	multiple_choice	
Option	$\frac{1}{8}$	incorrect
Option	$-\frac{1}{8}$	correct
Option	$\frac{1}{6}$	incorrect
Option	$-\frac{1}{6}$	incorrect
Solution	Given equation is (2x+3) (3x+1) = (3x-1) (2x-1) $= 6x^2 + 11x + 3$ $= 6x^2 - 5x + 1$ = 16x +2 16x = -2 $x = -\frac{1}{8}$	
Marks	4	1

Question	A journey of 300 km takes two hours more when the speed of a care is reduced by 5km/hr. What is the original speed of the car?	
Type	multiple_choice	
Option	30	correct
Option	40	incorrect

Option	70	incorrect
Option	80	incorrect
Solution	Let the speed of the car is x km/hr. Then Speed = distance/ time: $\frac{300}{x-5} - \frac{300}{x} = 2$ => $\frac{x - x + 5}{x(x-5)} = \frac{2}{300} = \frac{1}{150}$ $x^2 - 5x - 750 = 0$ $x^2 - 30x + 25x - 750 = 0$ $(x - 30)(x + 25) = 0$ $x = 30$ or $x = -25$ The negative value of x is inadmissible; therefore the speed of the car is 30 km/hr.	
Marks	4	1

Question	Today Madan is 20 years younger than his father. Ten years ago he was one-half as old as his father. How old his father is ten years hence?	
Type	multiple_choice	
Option	40	incorrect
Option	50	correct
Option	60	incorrect

Option	Data not adequate	incorrect
Solution	Let the age of Madan and his father be x and y years respectively. Then y-x = 20 ....(i) Ten year ago: x-10= $\frac{1}{2}$ (y-10) 2(x-10) = y - 10 2x - 20 = y - 10 2x - y = - 10 + 20 2x - y = 10 Now solving eq.1 and eq.2: y - x = 20 - y + 2x = 10 x = 30 (age of Madan) So, age of his father: y = x + 20 = 30 + 20 = 50 Madan's father age after 10 years: y+10 = 50 + 10 = 60 years	
Marks	4	1

Question	The numerator of a fraction is 3 less than the denominator. If numerator be made 3 times and 20 is added to the denominator, the fraction becomes 1/8. What is the fraction?	
Type	multiple_choice	
Option	420, 489 cm2	incorrect
Option	520, 494 cm2	incorrect
Option	620, 482 cm2	incorrect
Option	520, 486 cm2	correct
Solution	Given: Dimension of cuboid = 117 cm × 72 cm × 45 cm Side of a cube = 9 cm Formula used: Volume of the cuboid = (l × b × h) Where, l = length, b = width, h = height Volume of cube = (side)^3 Total surface area of cube = 6 × (side)^2 Calculation: Let the number of cubes be n Volume of cuboid = n × volume of cube ⇒ 117 x 72 × 45 = n × (9)^3 ⇒ n = 13 × 8 × 5 ⇒ n = 520 Total surface area of one cube = 6 × (side)^2 ⇒ Total surface area of one cube = 6 × (9)^2 ⇒ Total surface area of one cube = 486 cm2 ∴ The number of cubes and the total surface area of a cube are 520 and 486 cm2.	
Marks	4	1

Question	If x = (√2 + 1)/(√2 - 1), then what is the value of (x5 + x4 + x2 + x)/x3 ?	
Type	multiple_choice	
Option	40	correct
Option	39	incorrect

Option	38.5	incorrect
Option	41	incorrect
Solution	Given: x = (√2 + 1)/(√2 - 1) Multiplying numerator and denominator by (√2 + 1), we get ⇒ x = $(\sqrt{2} + 1)^2/(2 - 1) = 3 + 2\sqrt{2}$ To find: $(x^5 + x^4 + x^2 + x)/x^3$ ⇒ $x^2 + x + 1/x + 1/x^2$ Calculating x + 1/x, we get $3 + 2\sqrt{2} + [1/(3 + 2\sqrt{2})] = [(3 + 2\sqrt{2})^2 + 1]/(3 + 2\sqrt{2})$ ⇒ (9 + 8 + 12√2 + 1)/(3 + 2√2) ⇒ 6(3 + 2√2)/(3 + 2√2) ⇒ 6 Now, $x^2 + x + 1/x + 1/x^2 = (x + 1/x)^2 - 2 + (x + 1/x)$ Substituting (x + 1/x) = 6, we get ⇒ $6^2 - 2 + 6 = 40$	
Marks	4	1

Question	Find the values of a and b so that x4 + x3 + 8x2 + ax + b is divisible by x2 - 1.	
Type	multiple_choice	
Option	a = 1, b = 7	incorrect
Option	a = -1, b = 7	incorrect
Option	a = -1, b = -7	incorrect
Option	a = -1, b = -9	correct

Solution	We are looking for values of a and b such that the polynomial $x^4+x^3+8x^2+ax+b$ is divisible by x^2-1. This means the remainder when dividing this polynomial by x^2-1 should be 0. We can use the fact that if a polynomial f(x) is divisible by x^2-1, then the polynomial must have f(1) = 0 and f(-1) = 0 . Calculate f(1) and f(-1) Let f(x) = $x^4+x^3+8x^2+ax+b$. For f(1) = 0 : $f(1)=1^4+1^3+8(1^2)+a(1)+b=1+1+8+a+b=10+a+b$ So $10+a+b=0$ $\Rightarrow a+b=-10 \quad \text{(Equation 1)}$ For f(-1) = 0 : $f(-1)=(-1)^4+(-1)^3+8(-1)^2+a(-1)+b=1-1+8-a+b=8-a+b$ So $8-a+b=0$ $\Rightarrow -a+b=-8 \quad \text{(Equation 2)}$ To solve, add both equations: $(a+b)+(-a+b)=-10+(-8)$ $\Rightarrow 2b=-18$ $\Rightarrow b=-9$ Substitute b = -9 into Equation 1 $a+(-9)=-10$ $\Rightarrow a=-1$	
Marks	4	1

Question	Three consecutive integers add up to 54. What is the largest integer?	
Type	multiple_choice	
Option	18	incorrect
Option	15	incorrect

Option	17	incorrect
Option	19	correct
Solution	x (the smallest integer), x +1 (the middle integer), x + 2 (the largest integer). The sum of these three integers is given as 54: $x+(x+1)+(x+2)=54$ $\Rightarrow x+x+1+x+2=54$ This simplifies to: $3x+3=54$ $\Rightarrow 3x=51$ $\Rightarrow x=\frac{51}{3}=17$ The first integer x= 17, The second integer is x+ 1 = 18, The third (largest) integer is x+ 2 = 19.	
Marks	4	1

Question	The difference between the squares of two consecutive numbers is 95. Find the numbers.	
Type	multiple_choice	
Option	29,30	incorrect
Option	47,48	correct
Option	45,46	incorrect
Option	48,49	incorrect

Solution	Let the two consecutive numbers be x and x +1. Expanding the squares: $a^2 - b^2 = (a - b)(a + b)$ $(x + 1)^2 - x^2$ $\Rightarrow (x+1)^2 - x^2 = (x+1-x)(x+1+x) = 1(2x+1) = 2x+1$ $\Rightarrow 2x + 1 = 95$ $\Rightarrow x = \frac{94}{2} = 47$ The two consecutive numbers are x= 47 and x + 1 = 48. The two numbers are 47 and 48 .	
Marks	4	1

Question	If x = √10 + 3 then find the value of x^3 - $1/x^3$	
Type	multiple_choice	
Option	210	incorrect
Option	234	correct
Option	220	incorrect
Option	235	incorrect

Solution	x = √10 + 3 **Formula used:** If $\mathrm{x} - \frac{1}{\mathrm{x}} = \mathrm{a}$ $\Rightarrow x^3 - \frac{1}{x^3} = a^3 + 3a$ **Calculation:** x = √10 + 3 ⇒ 1/x = √10 - 3 $\Rightarrow x - \frac{1}{x} = 6$ $\Rightarrow x^3 - \frac{1}{x^3} = 6^3 + 3 \times 6$ $\Rightarrow x^3 - \frac{1}{x^3} = 234$ **∴ The required value is 234.**	
Marks	4	1

Question	**If a = 2.234, b = 3.121 and c = –5.355, then the value of $a^3 + b^3 + c^3 - 3abc$ is**	
Type	multiple_choice	
Option	1	incorrect
Option	-1	incorrect
Option	2	incorrect
Option	0	correct
Solution	a + b + c = 2.234 + 3.121 – 5.355 = 0 If a + b + c = 0, then $a^3 + b^3 + c^3 - 3abc = 0$, which can be proved as under a + b = – c Cubing both sides, we get $(a + b)^3 = (-c)^3$	

	$\Rightarrow a^3 + b^3 + 3ab(a + b) = -c^3$ $\Rightarrow a^3 + b^3 + 3ab(-c) = -c^3$ $\Rightarrow a^3 + b^3 - 3abc = -c^3$ $\Rightarrow a^3 + b^3 + c^3 - 3abc = 0$	
Marks	4	1

Question	**Consider the following statements** **I. x + 3 is the factor of x3 + 2x2 + 3x + 8.** **II. x – 2 is the factor of x3 + 2x2 + 3x + 8.** **Which of the statements given above is/are correct?**	
Type	multiple_choice	
Option	Only I	incorrect
Option	Only II	incorrect
Option	Both I and II	incorrect
Option	Neither I nor II	correct

Solution	Put $x = -3$ in equation $x^3 + 2x^2 + 3x + 8$ $= (-3)^3 + 2(-3)^2 + 3(-3) + 8$ $= -10 \neq 0$ So, $(x + 3)$ is not the factor of $x^3 + 2x^2 + 3x + 8$ Similarly, put $x = 2$ in above equation $= (2)^3 + 2(2)^2 + 3(2) + 8$ $= 30 \neq 0$ So, $(x - 2)$ is also not the factor ot $x^3 + 2x^2 + 3x + 8$.	
Marks	4	1

Question	If 3x4 – 2x3 + 3x2 – 2x + 3 is divided by (3x + 2), then the remainder is	
Type	multiple_choice	
Option	0	incorrect
Option	181/27	incorrect
Option	185/27	correct
Option	¾	incorrect

Solution	$\mathbf{f(x) = 3x^4 - 2x^3 + 3x^2 - 2x + 3}$ $(3x+2) = 0 \Rightarrow x = \frac{-2}{3}$ Remainder = $f(\frac{-2}{3}) = 3(\frac{-2}{3})^4 - 2(\frac{-2}{3})^3 + 3(\frac{-2}{3})^2 - 2(\frac{-2}{3}) + 3$ $= 3 \times \frac{16}{81} - 2 \times \frac{-8}{27} + 3 \times \frac{4}{9} + \frac{4}{3} + 3$ $= \frac{16}{27} + \frac{16}{27} + \frac{4}{3} + \frac{4}{3} + 3 = \frac{32}{27} + \frac{8}{3} + 3$ $= \frac{32+72+81}{27} = \frac{185}{27}$	
Marks	4	1

Question	If $\frac{5x}{2x^2 + 5x + 1} = \frac{1}{3}$, then the value of $\left(x + \frac{1}{2x}\right)$ is	
Type	multiple_choice	
Option	10	incorrect
Option	20	incorrect
Option	5	correct
Option	0	incorrect

Solution	$\frac{5x}{2x^2 + 5x + 1} = \frac{1}{3}$ Dividing numerator & denominator by 2x $= \frac{\frac{5}{2}}{x + \frac{5}{2} + \frac{1}{2x}} = \frac{1}{3}$ $= \frac{\frac{5}{2}}{x + \frac{1}{2x} + \frac{5}{2}} = \frac{1}{3}$ $\Rightarrow (x + \frac{1}{2x}) + \frac{5}{2} = \frac{15}{2}$ $\Rightarrow (x + \frac{1}{2x}) = \frac{15}{2} - \frac{5}{2}$ $\Rightarrow (x + \frac{1}{2x}) = 5$	
Marks	4	1

Question	If $p^3 + 3p^2 + 3p = 7$, then the value of $p^2 + 2p$ is	
Type	multiple_choice	
Option	3	correct
Option	2	incorrect
Option	5	incorrect
Option	1	incorrect
Solution	$p^3 + 3p^2 + 3p = 7$ $\Rightarrow\ p^3 + 3p^2 + 3p + 1 = 7 + 1 = 8$ $\Rightarrow\ (p + 1)^3 = (2)^3$ $\Rightarrow\ p + 1 = 2 \Rightarrow p = 1$ $\therefore\ p^2 + 2p = 1 + 2 \times 1 = 1 + 2 = 3.$	
Marks	4	1

Question	**If $a + b + c = 0$, then the value of $(a + b - c)^2 + (b + c - a)^2 + (c + a - b)^2$ is**	
Type	multiple_choice	
Option	8 abc	incorrect
Option	4(a2 + b2 + c2)	correct
Option	4(ab + bc + ca)	incorrect
Option	0	incorrect

Solution	Given, $a + b + c = 0$ $\therefore \quad a + b = -c, \quad b + c = -a, \quad c + a = -b$ $\therefore \quad (a + b - c)^2 + (b + c - a)^2 + (c + a - b)^2$ $\Rightarrow \quad (-c - c)^2 + (-a - a)^2 + (-b - b)^2$ $\Rightarrow \quad (-2c)^2 + (-2a)^2 + (-2b)^2$ $\Rightarrow \quad 4c^2 + 4a^2 + 4b^2 = 4(a^2 + b^2 + c^2)$	
Marks	4	1

Question	If $x + \frac{1}{x} = 2$ and x is real, then the value of $x17 + \frac{1}{x^{19}}$ is	
Type	multiple_choice	
Option	2	correct
Option	64	incorrect
Option	1	incorrect
Option	0	incorrect

Solution	Given, $x + \frac{1}{x} = 2$ $\Rightarrow x^2 + 1 = 2x \Rightarrow x^2 + 1 - 2x = 0$ $\Rightarrow x^2 - 2x + 1 = 0 \Rightarrow (x-1)^2 = 0 \Rightarrow x = 1$ $\therefore \quad x^{17} + \frac{1}{x^{19}} = 1 + 1 = 2.$	
Marks	4	1

Question	If X+ 1/X = sqrt(5) then find sqrt(x)(sqrt(x)-1)	
Type	multiple_choice	
Option	1	correct
Option	5	incorrect
Option	2	incorrect
Option	4	incorrect

Solution	$x^2 + \frac{1}{x^2} = 7$ $x + \frac{1}{x} = 3$ $x - \frac{1}{x} = \sqrt{5}$ $2x = 3 + \sqrt{5}$ $x = \frac{3 + \sqrt{5}}{2}$ $x = \frac{6 + 2\sqrt{5}}{4}$ $x = (\frac{\sqrt{5} + 1}{2})^2$ $\sqrt{x} = \frac{\sqrt{5} + 1}{2}$ $\sqrt{x}\,(\sqrt{x} - 1) = (\frac{\sqrt{5} + 1}{2})(\frac{\sqrt{5} + 1}{2} - 1)$ $= \frac{\sqrt{5} + 1}{2} \times \frac{\sqrt{5} - 1}{2} = \frac{5 - 1}{4} = 1$	
Marks	4	1

Question	If $\dfrac{a^2+b^2+c^2}{a^2-b^2-c^2}+\dfrac{b^2+c^2+a^2}{b^2-c^2-a^2}+\dfrac{c^2+a^2+b^2}{c^2-a^2-b^2}=?$	
Type	multiple_choice	
Option	4	incorrect
Option	8	incorrect
Option	2	incorrect
Option	0	correct
Solution	$\dfrac{a^2+b^2+c^2}{a^2-b^2-c^2}+\dfrac{b^2+c^2+a^2}{b^2-c^2-a^2}+\dfrac{c^2+a^2+b^2}{c^2-a^2-b^2}-3+3$ $=\dfrac{a^2+b^2+c^2+a^2-b^2-c^2}{a^2-b^2-c^2}+\dfrac{b^2+c^2+a^2+b^2-c^2-a^2}{b^2-c^2-a^2}+\dfrac{c^2+a^2+b^2+c^2-a^2-b^2}{c^2-a^2-b^2}-3$	

	$= \frac{2a^2}{a^2 - b^2 - c^2} + \frac{2b^2}{b^2 - c^2 - a^2} + \frac{2c^2}{c^2 - a^2 - b^2} - 3$ Now, $a + b = c$ $a = c - b$ $a^2 - b^2 - c^2 = -2bc$ ....(i) and $a + b = c$ $b = c - a$ $b^2 - c^2 - a^2 = -2ac$ ....(ii) and $a + b = c$ $c^2 - a^2 - b^2 = 2ab$ ....(iii) $a + b = c$ $a + b - c = 0$ $a^3 + b^3 - c^3 = -3abc$ ....(iv) $-a^3 - b^3 + c^3 = 3abc$

	$$= \frac{2a^2}{-2bc} + \frac{2b^2}{-2ac} + \frac{2c^2}{2ab} - 3$$ $$= \frac{-a^2}{bc} - \frac{b^2}{ac} + \frac{c^2}{ab} - 3$$ $$= \frac{-a^3 - b^3 + c^3}{abc} - 3$$ $$= \frac{3abc}{abc} - 3$$ $$= 0$$	
Marks	4	1

Question	**If $x + \frac{1}{x} = 0$ than $x^{12} + x^{14} + x^{16} + x^{18} = ?$**	
Type	multiple_choice	
Option	1	incorrect
Option	-1	incorrect
Option	2	incorrect
Option	0	correct

Solution	$x + \frac{1}{x} = 0$ $x^2 + 1 = 0$ $x^2 = -1$ $x^4 = 1$ $x^{12} + x^{14} + x^{16} + x^{18} = (x^4)^3 + (x^2)^7 + (x^4)^4 + (x^2)^9$ $= 1 - 1 + 1 - 1$ $= 0$	
Marks	4	1

Question	(|x| - 3) (|y| + 4) = 12. How many pairs of integers (x,y) satisfy this equation?	
Type	multiple_choice	
Option	10	correct
Option	8	incorrect
Option	9	incorrect
Option	12	incorrect

Solution	If x and y are integers, so are |x| −3 and |y| + 4. So, we start by finding out in how many ways 12 can be written as the product of two integers. 12 can be written as 12 * 1, or 6 * 2, or 3 * 4. To start with, we can eliminate the possibilities where the two terms are negative as |y| + 4 cannot be negative. Further, we can see that |y| + 4 cannot be less than 4. So, among the values, we can have |y| +4 take values 4, 6 or 12 only, or |y| can take values 0, 2 and 8 only. When |y| = 0, |x| - 3 = 3, |x| = 6, x can be +6 or -6. Two pairs of values are possible: (6, 0) and (-6, 0) When |y| = 2, |x| - 3 = 2, |x| = 5, x can be +5 or --5. There are four possible pairs here: (5, 2) , (-5, 2), (5, -2), (-5, -2) When |y| = 8, |x| - 3 = 1, |x| = 4, x can be +4 or --4. There are four possible pairs here: (4, 8) , (-4, 8), (4, -8), (-4, -8) The question is "(**|x| - 3) (|y| + 4) = 12. How many pairs of integers (x,y) satisfy this equation?"** **Hence the answer is "10"**	
Marks	4	1

Question	x + |y| = 8, |x| + y = 6. How many pairs of x, y satisfy these two equations?	
Type	multiple_choice	
Option	1	correct
Option	0	incorrect
Option	2	incorrect
Option	4	incorrect

Solution	The first equation is a pair of lines defined by the equations y = 8 − x ------- (i) (when y is positive) y = x − 8 ------- (ii) (when y is negative) With the condition that $x \leq 8$ (because if x becomes more than 8, |y| will be forced to be negative, which is not allowed) The second equation is a pair of lines defined by the equations: y = 6 − x ------- (iii) (when x is positive) y = 6 + x ------- (iv) (when x is negative) with the condition that y cannot be greater than 6, because if y > 6, |x| will have to be negative. On checking for the slopes, you will see that lines (i) and (iii) are parallel. Also (ii) and (iv) are parallel (same slope). Lines (i) and (iv) will intersect, but only for x = 1; which is not possible as equation (iv) holds good only when x is negative. Lines (ii) and (iii) do intersect within the given constraints. We get x = 7, y = -1. This satisfies both equations. Only one solution is possible for this system of equations. The question is "**x + |y| = 8, |x| + y = 6. How many pairs of x, y satisfy these two equations?**" **Hence the answer is "1"**	
Marks	4	1

Question	X^2 - 9x + |k| = 0 has real roots. How many integer values can 'k' take?	
Type	multiple_choice	
Option	45	incorrect
Option	43	incorrect
Option	42	incorrect
Option	41	correct

Solution	Discriminant, D = 81 – 4|k| If roots are real, D > 0 81 – 4|k| > 0 4|k| < 81 |k| < 20.25 Hence, −20.25 < k < 20.25 The integer values that k can take are −20, −19, −18 ... 0 ... 18, 19 and 20. 41 different values (Remember to include 0.) The question is "**x^2 - 9x + |k| = 0 has real roots. How many integer values can 'k' take?**" **Hence the answer is "41"**	
Marks	4	1

Question	2x + 5y = 103. Find the number of pairs of positive integers x and y that satisfy this equation?	
Type	multiple_choice	
Option	20	incorrect
Option	8	incorrect
Option	12	incorrect
Option	10	correct
Solution	Rearranging the equation, we get: 2x = 103 – 5y This says that when you subtract a multiple of 5 from 103, you get an even number. You have to subtract an odd multiple of 5 from 103 in order to get an even number. There are 20 multiples of 5 till 100, ten of which are odd. (Note that you cannot subtract 105, or higher multiples as they result in a negative value for x.) So, y can have ten integer values. x also has 10 integer values, each corresponding to a particular value of y. y = 1, gives us a potential value for x, so do y = 3, 5, 7....19. y can take 10 values totally. The question is "**Find the number of pairs of positive integers x and y that satisfy this equation? "** **Hence the answer is "10"**	

Marks	4	1

Question	Equation $x^2 + 5x - 7 = 0$ has roots a and b. Equation $2x^2 + px + q = 0$ has roots a + 1 and b + 1. Find p + q?	
Type	multiple_choice	
Option	2	incorrect
Option	0	incorrect
Option	16	incorrect
Option	-16	correct
Solution	Given, $x^2 + 5x - 7 = 0$ has roots a and b. We know that, Sum of roots in a quadratic equation = a+b = $\frac{(-5)}{1}$ = -5. Product of the roots = ab = $\frac{(-7)}{1}$ = -7. Now, The second equation $2x^2 + px + q = 0$ has roots a + 1 and b + 1. Sum of the roots = a+1+b+1 = a+b+2 = $\frac{(-p)}{2}$ = -5 +2 = -3 = $\frac{(-p)}{2}$ => -p = -6 => p =6. Product of the roots = (a+1)(b+1) = ab+a+b+1 = $\frac{q}{2}$. We know the values of ab and a+b. Substituting this, we get, -7+(-5)+1 = $\frac{q}{2}$ => -11 = $\frac{q}{2}$ => q =-22. Hence, p = 6 and q = -22. => p+q = 6 +(-22) = -16. The question is "**Equation $x^2 + 5x - 7 = 0$ has roots a and b. Equation $2x^2 + px + q = 0$ has roots a + 1 and b + 1. Find p + q?**" **Hence the answer is "-16"**	
Marks	4	1

Question	**Calculate the value of r from the equation ab - 3a + 5b + r?**

Type	multiple_choice	
Option	-15	incorrect
Option	7	incorrect
Option	-9	incorrect
Option	31	correct
Solution	On factorizing the equation ab -3a + 5b + r we get = a(b-3)+5(b-3)= ab – 3a + 5b - 15 Therefore r= -15	
Marks	4	1

Question	**A mother said to her daughter, "When you were born, I was as old as you are now." If the mother's age is 36 years at present, find the daughter's age four years back.**	
Type	multiple_choice	
Option	8 years	incorrect
Option	10 yeas	incorrect
Option	12 years	incorrect
Option	14 years	correct
Solution	If we mark a daughter's current age as x. Then, her mother's age at the time of her daughter's birth will be, (36-x) = x 2x = 36 X= 18.	

	Therefore, if the daughter is 18 years old at present then her age four years back will be, 18 - 4 = 14 years	
Marks	4	1

Question	The sum of values of x satisfying x^2/3 + x^1/3 = 2 is:	
Type	multiple_choice	
Option	-3	incorrect
Option	3	incorrect
Option	7	incorrect
Option	-7	correct
Solution	$(a + b)^3 = a^3 + b^3 + 3ab(a + b)$ **Calculation:** $\Rightarrow x^{2/3} + x^{1/3} = 2$ $\Rightarrow (x^{2/3} + x^{1/3})^3 = 2^3$ $\Rightarrow x^2 + x + 3x(x^{2/3} + x^{1/3}) = 8$ $\Rightarrow x^2 + 7x - 8 = 0$ $\Rightarrow x^2 + 8x - x - 8 = 0$ $\Rightarrow x (x + 8) - 1 (x + 8) = 0$ $\Rightarrow x = - 8$ or $x = 1$ **∴ Sum of values of x = -8 + 1 = - 7.**	
Marks	4	1