

CO-Wise AKTU Question Bank

Course: B.Tech

Subject Name: Elementary Mathematics -1

Subject Code: BBT101

Semester: I

CO No.	Lect. No.	Syllabus Topic (As Per LP)	Ques. No.	Question Statement (As Per AKTU)	Session
1	6	Algebraic solution of linear inequalities in one variable	1	Solve $5x - 3 < 3x - 1$, when x is a real number.(Very short)	2021-22
1	1	Fundamental Theorem of Algebra	2	State Fundamental theorem of Algebra.(Very Short)	2011-12 2013-14 2018-19 2021-22, 2022-23
1	6,7	Algebraic solution of linear inequalities in one variable, and their representation on number line.	3	Solve $\frac{3x-4}{2} \geq \frac{x+1}{4} - 1$. Also represent the solution set on number line. (Short)	2021-22
1	3	Solution of Quadratic equation by Discriminant formula	4	Solve the equation $x^2 + 2x + 2 = 0$. (Long)	2021-22
1	8	Graphical solution of linear inequalities in two variables	5	Exhibit graphically the solution set of linear inequalities $3x + 4y \geq 12, x \geq 0, y \geq 1$. (Long)	2021-22
1	2	Solution of Quadratic equation by Factorization formula	6	Solve the quadratic equation: $x^2 - 11x + 30 = 0$. (very short)	2022-23
1	6	Algebraic solution of linear inequalities in one variable	7	Solve the inequality: $\frac{1}{2}\left(\frac{3}{5}x + 4\right) \geq \frac{1}{3}(x - 6)$. (short)	2022-23
1	8	Graphical solution of linear inequalities in two variables	8	Find the area of the region represented by linear inequalities: $ x - y \leq 3$ and $ x + y \leq 3$. (long)	2022-23
1	8	Graphical solution of linear inequalities in two variables	9	Solve the system of linear inequalities $y \geq -x - 1, y \leq 2x + 1$, by graphical method.	2022-23
1	3	Solution of Quadratic equation by Discriminant formula	10	Solve the equation: $x^2 + 3x + 5 = 0$	2011-12 (Long)

1	3	Solution of Quadratic equation by Factorization formula	11	For what value of k , $(4-k)x^2 + (2k+4)x + (8k+1) = 0$	2018-19 (Long)
1	3	Solution of Quadratic equation by Factorization formula	12	Solve: $x^2 - 1 = 0$	2019-20 (Short)
1	3	Solution of Quadratic equation by Factorization formula	13	Solve: $(x+1)(x-2) + x = 0$	2020-21 (Long)
1	6	Algebraic solution of linear inequalities in one variable	14	Define linear inequality in one variable.	2019-20 2020-21 (Short)
1	6	Algebraic solution of linear inequalities in one variable	15	Solve: $5x - 3 < 3x + 1$	2011-12 (Short)
1	6	Algebraic solution of linear inequalities in one variable	16	Solve the linear inequality $4x + 3 < 5x + 7$	2015-16 (Short)
1	6	Algebraic solution of linear inequalities in one variable	17	Solve: $5x - 3 < 3x - 1$ when x is a real number.	2020-21 (Long)
1	6	Algebraic solution of linear inequalities in one variable	18	Solve: $\frac{(2x+4)}{(x-1)} \geq 5$.	2020-21 (Long)
1	8	Graphical solution of linear inequalities in two variables	19	Solve the inequality graphically $ y - x \leq 3$	2019-20 (Long)
1	6	Algebraic solution of linear inequalities in one variable	20	Solve the inequality: $x - 4 \geq 10$	2020-21 (Short)
1	7	Algebraic solution of linear inequalities in one variable and their representation on number line.	21	Solve $\frac{3x-4}{2} \geq \frac{x+1}{4} - 1$. Show that the graph of the solution on the number line.	2011-12 (Short)
1	7	Algebraic solution of linear inequalities in one variable and their representation on number line.	22	Solve the system of inequalities: $3x - 7 < 5 + x$ $11 - 5x \leq 1$ And represent the solutions on the number line.	2011-12 (Long)
1	7	Algebraic solution of linear inequalities in one variable and their representation on number line.	23	Solve the inequality and represent it on number line: $5(2x - 7) - 3(2x + 3) \leq 0$, $2x + 19 \leq 6x + 47$	2018-19 (Long)

1	8	Graphical solution of linear inequalities in two variable	24	Solve the following system of inequalities by graphical method: $2x + y \geq 6, 3x + 4y \leq 12$	2015-16 (Short)
1	8	Graphical solution of linear inequalities in two variable	25	Exhibit graphically the solution set of linear inequalities: $3x + 4y \geq 12, x \geq 0, y \geq 1$	2019-20 (Long)

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The logo for 'miot' features the letters 'miot' in a rounded, lowercase font. The 'm' and 't' are grey, while the 'i' and 'o' are red. A red horizontal bar is positioned below the 'o'.

CO-Wise AKTU Question Bank

Course: B.Tech

Subject Name: Elementary Mathematics -I

Subject Code: BBT101

Semester: 1

CO No.	Lect. No.	Syllabus Topic (As Per LP)	Ques. No.	Question Statement (As Per AKTU)	Session
2	10	Sum of n terms of A.P.	1	Find the sum of 3+6+9...+30. (very short)	2021-22
2	12	Geometric mean	2	Find the geometric mean between 1 and $\frac{9}{16}$. (very short)	2021-22
2	14	Sum of n terms and infinite terms of G.P.	3	Given a G.P. with $a = 727$ and 7^{th} is 64. Determine S_7 . (short)	2021-22
2	15	Some numerical problems	4	Is 184 a term of the sequence 3,7,11,...?	2019-20
2	9	A.P. and its general terms	5	Find the total no. of terms in arithmetic progression 3, 5, 7, ... , 51. (very short)	2022-23
2	15	Some numerical problems	6	Find the sum of the series $0.7 + 0.77 + 0.777 + \dots$ up to 20 terms. (short)	2022-23
2	13	G.P. and its general term	7	Find the third term from the last of geometric progression $\frac{2}{27}, \frac{2}{9}, \frac{2}{3}, \dots$ 162. (long)	2022-23
2	11	Some numerical problems related to A.P.	8	If S_n denotes the sum of first n terms of A.P. and find the value of $\frac{S_{3n} - S_{n-1}}{S_{2n} - S_{2n-1}}$	2022-23
2	10	Sum of n terms of A.P.	9	Which term of the A.P.: 3,8,13,... is 248?	2011-12 (Short)
2	10	Sum of n terms of A.P.	10	Find the nth term of an A.P 5,8,11,.....	2015-16 (Short)
2	10	Sum of n terms of A.P.	11	Which term of the A.P. 3,8,13,... is 248?	2018-19 (Short)
2	10	Sum of n terms of A.P.	12	Which term of the A.P.: 3,8,13,... is 78?	2020-21 (Long)

2	9	A.P. and its general terms	13	If $a_n = 5 - 11n$ find the common difference.	2020-21 (Short)
2	9	A.P. and its general terms	14	The first term of A.P is 2 and last term is 59. Find common difference if sum of all its terms is 610	2015-16 (Long)
2	11	Some numerical problems related to A.P.	15	The ratio of the sum of m and n terms of an A.P. is $m^2 - n^2$ Show that the ratio of m^{th} and n^{th} term is $(2m-1):(2n-1)$	2018-19 (Long)
2	10	Sum of n terms of A.P.	16	Find the sum of $2+4+6+\dots+20$.	2019-20 (Short)
2	10	Sum of n terms of A.P.	17	Find the sum of $3+6+9+\dots+30$.	2020-21 (Short)
2	9,10	A.P. and its general terms, Sum of n terms	18	The third term of an A.P is 7 and the seventh term is 2 more than 3 times the third term. Find the first term, the common difference and the sum of first 20 terms.	2011-12 (Long)
2	9,10	A.P. and its general terms, Sum of n terms	19	Find four numbers in A.P. whose sum is 20 and the sum of square is 120.	2019-20 (Long)
2	9,10	A.P. and its general terms, Sum of n terms	20	The first term of an A.P. is 5, the last term is 45 and the sum is 400. Find the number of terms and the common difference.	2020-21 (Long)
2	12	Geometric mean	21	The third term of G.P. is 4. Find the product of its first five terms.	2019-20 (Long)
2	14	Sum of n terms and infinite terms of G.P.	22	Find the sum $\sqrt{7}, \sqrt{21}, 3\sqrt{7}, \dots, n$ terms.	2018-19 (Long)
2	14	Sum of n terms and infinite terms of G.P.	23	Find four numbers forming G.P. in which the third term is greater than the first term by 9, and the second term is greater than the fourth term by 18.	2018-19 (Long)
2	14	Sum of n terms and infinite terms of G.P.	24	Find three numbers in G.P. whose sum is 38 and their product is 1728.	2019-20 (Long)
2	14	Sum of n terms and infinite terms of G.P.	25	Find the five geometric mean terms between 273 and 486	2013-14 (Long)
2	12	Relation between G.P	26	Find two positive numbers whose difference is 12 and whose A.M exceed the G.M by 2	2011-12 (Short)

2	14	Sum of n terms and infinite terms of G.P.	27	Find the sum to n terms of the series whose n^{th} term is $n(n + 3)$.	2015-16 (Long)
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CO-Wise AKTU Question Bank

Course: B.Tech

Subject Name: Elementary Mathematics -I

Subject Code: BBT101

Semester: I

CO No.	Lect. No.	Syllabus Topic (As Per LP)	Ques. No.	Question Statement (As Per AKTU)	Session
3	27	Standard equation of circle	1	Find the equation of circle whose center is (2,3) and radius 5. (very short)	2021-22,2022-23
3	28	Standard equation of parabola	2	Write the focus of parabola $x^2 = 4y$. (very short)	2021-22
3	20	Point slope form, Intercept form	3	Reduce the following equation into slope-intercept form and intercept form : $3x - 4y = 12$. (short)	2021-22
3	25	Distance of a point from line	4	Find the distance of the point (4,1) from the line $3x - 4y + 12 = 0$. (long)	2021-22
3	27	Properties of Ellipse	5	Find the length of major and minor axis, co-ordinates of foci and length of latus rectum for the ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$. (long)	2021-22
3	17	Straight lines	6	Find the slope of straight line passing through a point A(-3, 6) and the mid-point of the line joining the points B(4, -5) and C(-2, 9). (very short)	2022-23
3	25	Distance of a point	7	Let A(1,1) and B(3,2) be the two points. If C is a point on x-axis such that AC+BC is minimum then find co-ordinates of C. (long)	2022-23
3	28	Standard equation of parabola	8	Show that the equation $16x^2 + y^2 + 8xy - 74x - 78y + 212 = 0$. (long)	2022-23
3	24	Pair of intersecting lines	9	Find the coordinates of the point which divides the line segment joining the points (1,-2,3) and (3,4,-5) in the ratio 2:3 externally.	2011-12 (Long)
3	25	Distance of a point from line	10	Show that the points A(1,2,3), B(3,4,7) and C(-3,-2,-5) are collinear.	2011-12 (Short)

3	25	Distance of a point from line	11	Find the value of x for which the points $(x, -1), (2, 1)$ and $(4, 5)$ are collinear.	2011-12 (Long)
3	17	Condition of parallel and perpendicularity between two lines	12	Find the value of y so that the line through $(3, y)$ and $(2, 7)$ is parallel to the line through $(-1, 4)$ and $(0, 6)$	2011-12 (Short)
3	17	Condition of parallel and perpendicularity between two lines	13	Find the equation of line parallel to the line $3x - 4y + 2 = 0$ and passing through the point $(-2, 3)$.	2018-19 (Long)
3	17	Condition of parallel and perpendicularity between two lines	14	Write the condition of perpendicularity of two lines.	2019-20 (Short)
3	18	Angle between two lines	15	If the angle between two lines is $\frac{\pi}{4}$ and the slope of one line $\frac{1}{2}$, find the slope of the other line.	2020-21 (Long)
3	20	Point slope form, Intercept form	16	Write the equation of straight line in point slope form.	2019-20 (Short)
3	20	Point slope form, Intercept form	17	Find the equation of straight line joining the points $(-1, 3)$ and $(4, -2)$.	2019-20 (Long)
3	20	Point slope form, Intercept form	18	Find the equation of line passing through the point $(2, 2)$ and cutting off intercepts on the axis whose sum is 9.	2015-16 (Long)
3	20	Point slope form, Intercept form	19	Find the equation of the straight line which passes through the point $(3, 4)$ and the intercept made by this line on y -axis is two times the intercept on x -axis.	2013-14 (Long)
3	20	Point slope form, Intercept form	20	Find the equation of line in intercept form.	2018-19 (Short)
3	21	Equation of a line in normal form	21	Reduce the following equations into normal form and find their perpendicular distances from the origin (i) $x - \sqrt{3}y + 8 = 0$ $y - 2 = 0$	2018-19 (Long)
3	27	Standard equation of circle	22	Does the point $(5/2, 7/2)$ lie inside, outside or on the circle $x^2 + y^2 = 25$?	2011-12 (Long)

3	27	Standard equation of circle	23	Find the centre and radius of the circle $x^2 + y^2 - 4x + 6y = 12$	2011-12 (Short)
3	27	Standard equation of circle	24	Find the equation of the circle whose radius is 5 and which touches externally the circle $x^2 + y^2 - 2x - 4y = 20$ at the point (5,5).	2011-12 (Long)
3	27	Standard equation of circle	25	Find the equation of the circle which passes through the points (0,1),(1,0) and (2,1).Also find its radius and coordinate of the center.	2013-14 (Long)
3	27	Standard equation of circle	26	Find the equation of circle whose center is (3,2) and radius is 5.	2015-16 (Short)
3	27	Standard equation of circle	27	Find the equation of circle passing through (4,1) and (6,5), whose center is on the line $4x + y = 16$	2018-19 (Long)
3	27	Standard equation of circle	28	Find the equation of circle whose center is (2,3) and radius is 8.	2020-21 (Short)
3	27	Standard equation of circle	29	Find the equation of circle, the coordinates of whose diameter are (-1,2) and (4,-3).	2020-21 (Long)
3	28	Standard equation of parabola	30	Write the focus of the parabola: $x^2 = 8y$.	2018-19 2020-21 (Short)
3	28	Standard equation of parabola	31	Find the equation of parabola whose focus is the point $(-1, -2)$ and whose directrix is straight line $x - 2y + 3 = 0$	2019-20 2020-21 (Long)
3	28	Standard equation of parabola	32	Find eccentricity, co-ordinate of foci and length of latus rectum for the ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$	2015-16 (Long)
3	28	Standard equation of hyperbola	33	Find the equation of the hyperbola whose foci are $(0, \pm 12)$ and the length of the latus rectum is 36	2011-12 (Long)
3	28	Standard equation of hyperbola	34	Find the equation of hyperbola having directrix $x + 2y = 1$, focus(2,1) and eccentricity 2.	2013-14 (Long)

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CO-Wise AKTU Question Bank

Course: B.Tech

Subject Name: Elementary Mathematics-I

Subject Code: BBT-101

Semester: 1

CO No.	Lect. No.	Syllabus Topic (As Per LP)	Ques. No.	Question Statement (As Per AKTU)	Session
4	32	Derivative of sum and Product functions	1	If $y=(1-2x^2) \text{ Sin}x$ then find $\frac{dy}{dx}$	2022-23
4	37	Derivatives of Parametric forms	2	If $y= \text{Cot}(\cos^{-1}x)$ then find $\frac{dy}{dx}$	2022-23
4	38	Derivatives of polynomial	3	Find the differential coefficient of $x^2 \tan^2 x$ with respect to $\log_e x$.	2022-23
4	38	Derivatives of polynomial, parametric forms	4	If $x = \sqrt{a}^{\text{Sin}^{-1}t}$ and $y = \sqrt{a}^{\text{Cos}^{-1}t}$ the prove that $\frac{dy}{dx} = \frac{-y}{x}$	2022-23
4	31	Differentiability	5	If $y= \text{Sin}x$ then find $\frac{dy}{dx}$ at $x=0$	2021-22
4	29	Introduction, Definition of limit	6	Evaluate: $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$	2021-22
4	29	Introduction, Definition of limit	7	Evaluate: $\lim_{x \rightarrow 0} \frac{\sin 5x}{\sin 2x}$	2021-22
4	39	Differentiability Logarithmic differentiation.	8	Find $\frac{dy}{dx}$ if $y = \text{Sin} \sqrt{1 + \text{Log}(\tan x)}$	2021-22
4	30	Continuity	9	Find the value of k so that the function f is continuous at indicated value of $f(x) = f(x) = \begin{cases} kx, x \leq 2 \\ 3, x > 2 \end{cases}$	2021-22
4	29	Introduction, Definition of limit	10	Evaluate: $\lim_{x \rightarrow 0} \left(\frac{\sin 2x}{4x} \right)$.	2020-21 (Short)
4	29	Introduction, Definition of limit	11	Evaluate the given limit: $\lim_{x \rightarrow 2} \frac{x^2 - 4}{x - 2}$	2018-19 (Short)

4	29	Introduction, Definition of limit	12	Find $\lim_{x \rightarrow 0} f(x)$, where $f(x) = \begin{cases} \frac{ x }{x}, & x \neq 0 \\ 0, & x = 0 \end{cases}$	2018-19 (Long)
4	34	Derivatives of polynomial	13	Find the derivative of $x^2 - 2$ at $x = 100$.	2018-19 (Short)
4	34	Derivatives of Trigonometric functions	14	Find the derivative of $\sec^2 x$.	2018-19 (Short)
4	31	Differentiability	16	Discuss the differentiability of $f(x) = x^2$ at $x = 1$.	2019-20 (Short)
4	29	Introduction, Definition of limit	17	Evaluate: $\lim_{x \rightarrow 0} \frac{3x^2 - 2x + 1}{x - 1}$	2019-20 (Short)
4	29	limit	20	What is the value of $\lim_{x \rightarrow -1} [1 + x + x^2 + \dots + x^{10}]$.	2011-12 (Short)
4	32	Differentiation	21	Find the differential coefficient of $\sin x \cos x$	2012-13 (Short)
4	34	Derivatives of polynomial	22	Compute $\frac{dy}{dx}$ where $y = \sin x + \tan(x^2) + x^4$	2012-13 (Long)
4	34	Derivatives of polynomial	23	Find the derivative of $y = 9x^2 + \frac{3}{x} + 5 \tan^{-1} x$ with respect of x	2013-14 (Short)
4	29	Introduction, Definition of limit	24	Evaluate: $\lim_{x \rightarrow 0} \frac{\sin 5x}{\sin 2x}$	2012-13 (Short)
4	29	Introduction, Definition of limit	25	Find the value of: $\lim_{x \rightarrow 2} \left[\frac{x^3 - 4x^2 + 4x}{x^2 - 4} \right]$	2012-13 (Long)
4	29	Introduction, Definition of limit	26	Show that: $\lim_{x \rightarrow 0} (1 + x)^{\frac{1}{x}} = e$	2012-13 (Long)
4	34	Derivatives of polynomial, parametric forms	27	Find $\frac{dy}{dx}$ if $y = \sin(\sqrt{\sin x + \cos x})$	2013-14 (Long)

4	29	Introduction, Definition of limit	28	Evaluate: $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$	2013-14 (Long)
4	29	Introduction, Definition of limit	29	Evaluate: $\lim_{x \rightarrow 0} \left(\frac{3^x - 2^x}{x} \right)$	2013-14 (Long)
4	32	Derivative of sum and Product functions	30	If $y = \frac{1}{\tan x} - \frac{1}{\cot x}$, then find $\frac{dy}{dx}$.	2014-15 (Short)
4	32	Derivative of sum and Product functions	31	Find the derivative $y = \frac{1}{\tan x} + \frac{1}{\cot x}$	2015-16 (Short)
4	29	Introduction, Definition of limit	32	Evaluate: $\lim_{x \rightarrow 0} \left(\frac{e^x + e^{-x} - 2}{x^2} \right)$	2014-15 (Long)
4	29	Introduction, Definition of limit	33	Evaluate: $\lim_{\theta \rightarrow \frac{\pi}{2}} \left(\frac{1 - \cos 4\theta}{\sin 2\theta} \right)$.	2014-15 (Short)
4	30	Continuity	34	Test the existence of function $f(x) = x $ at $x = 0$.	2014-15 (Short)
4	29	Introduction, Definition of limit	35	Evaluate: $\lim_{x \rightarrow 2} \left(\frac{x^5 - 32}{x^3 - 8} \right)$	2015-16 (Long)
4	37	Derivatives of Parametric forms	36	If $y = \sin^{-1}(m \sin x)$, find $\frac{dy}{dx}$.	2019-20 2020-21 (Long)
4	32	Derivative of sum and Product functions	37	Find $\frac{dy}{dx}$ if $y = x \log x$	2020-21 (Short)
4	38	Derivatives of polynomial	38	Differentiate x^2 with respect to x^3 .	2020-21 (Long)
4	34	Derivatives of polynomial, parametric forms	39	If $y = \sqrt{\sin x + \sqrt{\sin x + \sqrt{\sin x + \dots \dots \dots \infty}}}$, find $\frac{dy}{dx}$.	2020-21 (Long)
5	37	Derivatives of Parametric form	40	Differentiate $(\cos x)^x$ with respect to x .	2019-20 (Long)
5	37	Derivatives of Parametric forms	41	Find $\frac{dy}{dx}$ if $y = (\log x)^{\cos x} + x^{\sin x}$.	2018-19 (Long)

CO-Wise AKTU Question Bank

Course: B.Tech

Subject Name: Elementary Mathematics-I

Subject Code: BBT-101

Semester: 1

CO No.	Lect. No.	Syllabus Topic (As Per LP)	Ques. No.	Question Statement (As Per AKTU)	Session
5	39	Applications of Derivatives as rate change	1	Find the rate of change of area of a Circle with respect to its Circumference at radius 3 Cm	2022-23
5	42	Approximations & Errors and Simple problems (that illustrate basic principles)	2	Find the approximate value of $(1.0002)^{3000}$ Using Differentiation.	2022-23
5	38	Lagrange's Mean Value Theorem	3	Find the area bounded by the Coordinate axis and normal to the curve $y = \log_e x$ at the point P(1,0)	2022-23
5	38	Lagrange's Mean Value Theorem (without proof) and its geometric interpretations	4	Verify Lagrange's mean value theorem if $f(x) = x(x-1)(x-2)$ in the interval $[0, 1/2]$.	2022-23
5	43	Maxima and minima of one variable.	5	Let $p(x)$ be a real polynomial of least degree which has a local maximum at $x=1$ and a local minimum at $x=3$. If $p(1)=6$, $p(3)=2$, then find the value of $\frac{dp}{dx}$ at $x=0$	2022-23
5	37	Rolle's Theorem (without proof) and its geometric interpretations	6	State Rolle's Theorem	2021-22
5	43	Maxima and minima of one variable.	7	Find maximum & minimum value of $y = x^3 - 3x^2 + 3$	2021-22
5	38	Lagrange's Mean Value Theorem	8	Verify mean value theorem if $y = x^2 + 2x + 3$ in the interval $[4,6]$.	2021-22
5	38	Lagrange's Mean Value Theorem	9	Find the equation of tangent and normal to the curve $y = x^2 + 2$ at the point P(1,3)	2021-22
5	38	Lagrange's Mean Value Theorem	10	Write the statement of Lagrange's Mean Value Theorems.	2012-13 2015-16 2019-20

					2020-21 (Short)
5	38	Lagrange's Mean Value Theorem	11	Verify LMVT for the function $f(x) = x^3 - 18x^2 + 99x - 162$ on $[3, 5]$.	2019-20 2020-21 (Long)
5	38	Lagrange's Mean Value Theorem	12	Find the equation of normal to the curve $y = x + \sin x \cos x$ at $x = \frac{\pi}{2}$	2019-20 (Short)
5	42	Approximations & Errors and Simple problems (that illustrate basic principles)	13	If $y = x^4 - 10$ and if x changes from 2 to 1.99, what is approximate change in y .	2019-20 (Long)
5	41	Tangents & Normals to the given curve	14	Find the equation of tangent intercepts of a line on x axis and y axis respectively.	2020-21 (Short)
5	41	Tangents & Normals to the given curve	15	Find the equation of the tangent to the curve $y = -5x^2 + 6x + 7$ at the point $\left(\frac{1}{2}, \frac{35}{4}\right)$.	2020-21 (Long)
5	43	Maxima and minima of one variable.	16	Find the maximum and minimum values of function $f(x) = \sin 3x + 4 \forall x \in (-\pi/2, \pi/2)$.	2019-20 2020-21 (Long)
5	38	Lagrange's Mean Value Theorem	17	Verify mean value theorem if $f(x) = 3x^2 - 4x - 3$ in the interval $[1, 4]$.	2018-19 (Long)
5	41	Tangents & Normals to the given curve	18	Find the slope of the tangent to the curve $y = 3x^4 - 4$ at $x = 4$.	2018-19 (Short)
5	41	Tangents & Normals to the given curve	19	Find the equation of all lines having slope 2 and tangent to the curve: $y + \frac{2}{x-3} = 0$.	2018-19 (Long)
5	37	Rolle's Theorem (without proof) and its geometric interpretations	20	Is Rolle's Theorem applicable to the function $f(x) = (x - 1)(x - 4)e^{-x}, x \in [0, 4]$	2011-12 (Short)
5	38	Lagrange's Mean Value Theorem	21	Write the statement of Lagrange's Mean Value Theorems.)

5	42	Approximations & Errors and Simple problems (that illustrate basic principles)	22	Find the approximate value of $f(3.02)$ Where $f(x) = 3x^2 + 5x + 3$	2014-15 (Long)
5	41	Tangents & Normals to the given curve	23	Find the slope of the tangent to the curve $y = x^3 - x$ at $x = 2$	2011-12 (Long)
5	41	Tangents & Normals to the given curve	24	Find the equation of the tangent to the curve $y = \frac{x-7}{(x-2)(x-3)}$ at the point where it cuts the x -axis	2013-14 (Long)
5	42	Approximations & Errors and Simple problems (that illustrate basic principles)	25	Find the approximate change in the volume V of a cube of side x meters caused by increasing the sides by 2%.	2013-14 (Long)
5	41	Tangents & Normals to the given curve	26	Find the slope of curve $y = 3x^4 - 4x^2 + 6$ at $(1,-1)$ and $(-1,2)$	2014-15 (Long)
5	41	Tangents & Normals to the given curve	27	Find the point at which the tangent to the curve $y = \sqrt{4x-3} - 1$ has its slope $2/3$	2014-15 (Long)
5	43	Maxima and minima of one variable.	28	Show that semi-vertical angle of right circular cone of given surface area and maximum volume is $\sin^{-1} \frac{1}{3}$	2015-16 (Long)
5	43	Maxima and minima of one variable.	29	Find the critical points of $y = 9x^2 + 12x + 2$	2012-13 (Long)
5	43	Maxima and minima of one variable.	30	Find the Maxima and Minima for the function $f(x) = x + \sin 2x$ in interval $0 \leq x \leq 2\pi$	2014-15 (Long)