Smart Syllabus / Accelerated Learning Programme (ALP)
Mathematics Grade-10
for Academic Session 2026-27 & BISE Exam-2027

Name of the Unit	Excluded Content & Questions of Mathematics-10
1 Complex Numbers	• 1.3.3 Properties of Complex Conjugate (Properties 1 to 4 with proofs), Examples 11 to 14; Pages # 11 to 13. • 1.4.1 Properties of Modulus of a Complex Number (Properties 1 to 3 with proofs), Examples 15 & 16; Pages # 14 to 16. • Exercise # 1.3: Q # 2, 3 & 4; Page # 16. • 1.6 Solution of Simultaneous Linear Equations with Complex Coefficients, Example 21; Page # 19. • Exercise # 1.4: Q # 2 (Complete); Page # 20. • Review Exercise # 1: Q # 5 & 8; Page # 21.
2 Quadratic Equations and Inequalities	• 2.1.1 (d) Solution of quadratic equation by graphs, Example 5. Pages # 27 to 28. • Exercise # 2.1: Q # 5 page # 29 • 2.2.3 Finding Points of Intersection of a Linear Function and a Quadratic Function Graphically, Example 8; Page # 31. • Exercise # 2.2: Q # 3; Page # 32. • Examples # 12 & 13; Pages # 35 to 36. • Exercise # 2.3: Q # 4, 8 & 9; Page # 36. • 2.5 Solution of Quadratic Inequalities in One Unknown, Examples 16 & 17; Pages # 39 to 41. • Exercise # 2.5 (Complete); Page # 41. • 2.7 Applications of Quadratic Equation in Real World, Examples 19 to 21; Pages # 43 to 45. • Exercise # 2.7 (Complete); Page # 45.
3 Matrices and Determinants	• 3.4.2 Associative Law of Multiplication of Matrices and 3.4.3 Distributive Laws of Multiplication over Addition and Subtraction; Pages # 62 to 64. • Exercise # 3.4: Q # 2 (ii, iii & v); Page # 65. • Challenge ($(AB)^{-1} = B^{-1}A^{-1}$); Page # 67. • Exercise # 3.5: Q # 8; Page # 70. • 3.7 Applications of Matrices in Real World Problems, Examples 12 & 13; Pages # 75 to 77. • 3.8 The Role of Mathematics in Scientific Theories and Technological Advancement; Page # 77. • Exercise # 3.6: Q # 3 to 9; Pages # 78 to 79. • Review Exercise # 3: Q # 3 (iii, iv, v & viii), Q # 6, 7 & 8; Page # 80.

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Name of the Unit	Excluded Content & Questions of Mathematics-10
4 Functions and Graphs	• 4.5 Solving Real life Problems Involving Function, Example # 15, 16; Pages # 92, 93. • 4.6 Solving Real life Problems Involving absolute Valued Function, Examples 17 to 18; Page # 93. • Exercise # 4.3: Complete; Page # 94 • Review Exercise # 4: Q # 9 to 11; Page # 96.
5 Algebraic Fractions	• 5.3 Type (ii) Exponential Equations, Type (iii) Reciprocal Equations and Type (iv) $(x + a)(x + b)(x + c)(x + d) = k$, Examples 11 to 13; Pages # 103 to 106. • Exercise # 5.4: Q # 1 (iv to xii); Pages # 106 to 107. • 5.4 Real World Problems Example # 14 &15; Pages # 107 to 108. • Exercise # 5.5 (Complete); Pages # 108 to 109. • Review Exercise # 5: Q # 1 (vii, viii), Q # 4 (iii to vii), Q# 5, 6 & 7; Page # 110.
6 Vectors in Plane	• 6.6 Translation by vector: Example 9; Pages 119 to 120. • 6.7 Solution and Application of Geometric Problems Involving Vectors, Examples 10 to 13; Pages # 120 to 122. • Exercise # 6.3: (Complete); Pages # 122 to 123. • Review Exercise # 6: Q # 1 (vii), Q # 6, 7, 8, 9 & 10; Page # 124.
7 Trigonometry	• 7.3 Solve Simple Trigonometric Problems in Three Dimensions, Examples 8 & 9; Pages # 134 to 135. • Exercise # 7.3: Q # 1 to 5; Pages # 136 to 137. • 7.5 Three Figure Bearing — Example12, 13 & 14; Pages # 138 to 139. • Exercise # 7.4: (Complete); Page # 139, 140. • Review Exercise # 7: Q # 1 (ix, x), Q # 4, 5, 6 & 7; Page # 142.
8 Chords and Arcs of a Circle	• 8.1.6 to 8.1.9 Theorems on Congruent Arcs, Chords and Central Angles, Examples 8 to 11; Pages # 151 to 152. • Exercise # 8.2 (Complete); Page # 153. • Review Exercise # 8: Q # 4 to 8; Page # 154.
9 Tangent and Angles of a Circle	• Exercise # 9.1: Q # 4, 5, 9 & 10; Pages # 160. • Exercise # 9.2: Q # 4, 5, 6 & 7; Page # 165. • Review Exercise # 9: Q # 4, 5, 6 & 7; Pages # 166 to 167.
10 Practical Geometry of Circles	• 10.1.4 Complete a Circle without Finding its Centre when a part of its circumference (Arc) is given; Pages # 170 to 171. • Exercise # 10.1: Q # 4 & 7; Page # 171. • Exercise # 10.2: Q # 1, 2, 3 & 4; Page # 174. • Review Exercise # 10: Q # 5 & 6; Page # 175.

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Name of the Unit	Excluded Content & Questions of Mathematics-10
11 Information Handling	• 11.1.1 Cumulative Frequency Polygon or Ogive and 11.1.2 Steps for Construction of Ogive; Page # 178. • Examples # 2 & 3; Pages # 179 to 181. • Exercise # 11.1: Q # 1, 2, 3, 5, 8 & 9; Page # 186 to 187. • Variance and Standard Deviation for Grouped Data, Example 11; Pages # 191. • Exercise # 11.2: Q # 6, 7& 10 and Q # 13 (ii & iii); Pages # 193 to 194. • Review Exercise # 11: Q # 2, 4, 6 & 9; Pages # 194 to 195.
12 Probability	• 12.2 (i) Addition Law for Non-Mutually Exclusive Events, Examples 8 & 10; Pages # 205 to 207. • Exercise # 12.2: Q # 1, 2, 7, 9, 13 & 14; Pages # 207 to 208. • 12.3 Multiplication Law of Probability (Independent Events, Dependent Events and Conditional Probability), Examples 11 to 13; Pages # 208 to 209. • Exercise # 12.3 (Complete); Page # 210. • Review Exercise # 12: Q # 3, 4, 5 & 6; Page # 211.

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Instructions for Preparation of Exam Paper of Mathematics for Grade-10

- **The paper of Mathematics for Grade-10 will consist of 75 marks.**
- **Objective Type = 15 marks & Subjective Type = 60 marks.**
- **Timing of the paper will be 2:30 hours.**
- **Objective Type = 20 minutes + Subjective Type = 2:10 hours.**
- **The paper will be made as per following details:**

Objective (MCQs)	**Q-1:** There will be 15 Multiple Choice Questions (MCQs) from the entire content of the textbook. The detail is as follows: One MCQ each from chapters 1, 2, 3, 4, 5, 6, 7, 8 and 10 and two MCQs each from chapters 9, 11, and 12.	$1 \times 15 = 15$
Part-I: Subjective	This section contains three (3) short questions. The detail is as follows: **Q-2:** Students are required to attempt any 6 out of 9 short questions. The details are as follows: • At least two short questions will be given each from chapters 1, 2, 3 & 4. **Q-3:** Students are required to attempt any 6 out of 9 short questions. The details are as follows: • At least two short questions will be given each from Chapters 5, 6, 7, and 8. **Q-4:** Students are required to attempt any 6 of the 9 short questions. The details are as follows: • At least two short questions will be given each from Chapters 9, 10, 11 and 12.	$2 \times 6 = 12$ $2 \times 6 = 12$ $2 \times 6 = 12$
Part-II: Subjective:	This section will contain three (3) long questions bifurcated in two-parts **a & b** (carrying 4 marks each) and students have to attempt two questions. The detail is as follows: **Q-5:** **(a)** One long-answer question will be selected from chapter 1. **(b)** One long-answer question will be selected from chapter 2. **Q-6:** **(a)** One long-answer question will be selected from chapter 3. **(b)** One long-answer question will be selected from chapter 4. **Q-7:** **(a)** One long-answer question will be selected from chapter 5. **(b)** One long-answer question will be selected from chapter 7.	$2 \times 8 = 16$

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Part-III: Subjective:	This section will contain two long questions bifurcated in two-parts **a & b** (carrying 4 marks each) and students have to attempt one question. The detail is as follows: **Q-8:** **(a)** One long-answer question will be selected from chapter 6. **(b)** One long-answer question will be selected either from chapter 8 or chapter 11. **Q-9:** **(a)** One long-answer question will be selected from chapter 10. **(b)** One long-answer question will be selected either from chapter 9 or chapter 12.	$1 \times 8 = 8$

MODEL PAPER OF MATHEMATICS FOR GRADE-10

Annual Examination 2027 — Smart Syllabus / ALP Academic Session 2026-27

OBJECTIVE TYPE

Time Allowed: 20 mins. **Max. Marks: 15**

Note: Encircle the correct answer. Each question carries one mark.

Cutting or overwriting in an MCQ cancels that answer. **(1 × 15 = 15)**

No.	Questions	A	B	C	D
i	Imaginary part of $(2 - i)(2 + i)$ is:	0	1	7	9
ii	Sum of the roots of $3x^2 + 5x - 12 = 0$ is:	$\frac{5}{3}$	$-\frac{5}{3}$	$\frac{12}{3}$	$\frac{3}{5}$
iii	If $A = \begin{bmatrix} 3 & 1 & 3 \\ 2 & 0 & 2 \end{bmatrix}$, then order of A^t is:	3-by-2	2-by-3	3-by-3	2-by-2
iv	If $f(x) = x^2 - 4$, $g(x) = x + 2$, $x \neq -2$, then $\frac{f(x)}{g(x)} =$	$\frac{1}{x - 2}$	$\frac{1}{x + 2}$	$x + 2$	$x - 2$
v	Lowest form of $\frac{18a^2bc^2}{12ac}$ is:	$\frac{9abc}{6}$	$\frac{3abc}{2}$	$\frac{18b}{12}$	$\frac{3}{2}$
vi	What is the value of $\lvert 3\underline{i} + 4\underline{j} \rvert$?	3	4	5	7
vii	cosec θ is positive in:	I & III quadrants	II & IV quadrants	I & II quadrants	I & IV quadrants
viii	A chord passing through the centre of the circle is called:	radius	diameter	secant	circumference
ix	In a circle, radius and tangent are:	parallel	equal	perpendicular	zero
x	What is the measure of an angle inscribed in a semi-circle?	45°	60°	90°	120°

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No.	Questions	A	B	C	D
xi	Tangents drawn from a single external point to a circle are:	unequal in length	perpendicular to each other	equal in length	inside the circle
xii	Difference between the highest and the lowest values is called:	mean	variance	range	standard deviation
xiii	Variance of the data 8, 8, 8, 8, 8, 8 is:	0	16	8	48
xiv	If one coin is tossed and one dice is rolled, then the number of sample points are:	3	6	2	12
xv	If $P(E) = 0.07$, then the probability of 'not E' is:	0.95	0.89	0.93	0.90

SUBJECTIVE TYPE

Time Allowed: 2:10 hrs. **Max. Marks: 60**

(Part-I)

2. Attempt any SIX of the following: (Units 1, 2, 3 & 4) **(2 × 6 = 12)**

(i) Simplify: $\left(\frac{i^8}{i^5}\right)^{-5}$

(ii) Find the values of a and b, if $(a + bi)(1 + 3i) = -8 + 11i$.

(iii) Solve the quadratic equation by factorization method: $6x^2 + 13x - 5 = 0$

(iv) Form a quadratic equation whose roots are $3 + \sqrt{5}, 3 - \sqrt{5}$.

(v) If the quadratic equation $16x^2 + 7px + 49 = 0$ has equal roots, then find the values of p.

(vi) If $X = \begin{bmatrix} 1 & -1 \\ -2 & 2 \end{bmatrix}$ and $Z = \begin{bmatrix} 3 & 0 \\ 0 & -2 \end{bmatrix}$, then find $4X - Z$.

(vii) Find the value of x when $A = \begin{bmatrix} x & 6 \\ 5 & 15 \end{bmatrix}$ is a singular matrix.

(viii) Given that $f(x) = 3x + 2$ and $g(x) = 2x + 3$. Find $f(g(-2))$.

(ix) Solve and express the solution on number line: $|7 - 2x| = 1$

3. Attempt any SIX of the following: (Units 5, 6, 7 & 8) **(6 × 2 = 12)**

(i) Reduce to lowest form: $\frac{3x^2 + 6x}{x^2 + 4x + 4}$

(ii) Simplify: $\frac{2}{x + 2y} - \frac{x - 6y}{x^2 - 4y^2}$

(iii) Write the vector $\overline{AB}$ in the form $x\underline{i} + y\underline{j}$, where $A(1, -7)$ and $B(-2, 4)$.

(iv) Find a unit vector in the direction of the vector $\underline{a} = 6\underline{i} + 8\underline{j}$.

(v) If $\underline{a} = \underline{i} + 3\underline{j}$, $\underline{c} = 2\underline{i} + \underline{j}$ and $\underline{a} + 2\underline{b} = \underline{c}$, then find $|\underline{b}|$.

(vi) Without using calculator, find the exact value of cot 120°.

(vii) Calculate area of triangle ABC, in which $a = 7$ cm, $b = 8$ cm, $\gamma = 38°$.

(viii) A chord 8 cm long is at a distance of 3 cm from the centre. Calculate the radius of the circle.

(ix) In a circle with centre at O, the perpendicular distance of the each chord PQ and RS from the centre is 6 cm. If the length of chord PQ is 18 cm, find the length of the other chord.

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4. Attempt any SIX of the following. (Units 9, 10, 11 & 12) **(6 × 2 = 12)**

(i) In a historical monument, a circular fountain with a radius of 3 m is built. A flagpole is erected 7 m away from the centre of the fountain. Two ropes from the pole are tied to the edge of the fountain, just touching it. Find the length of each rope.

(ii) Find ℓ and area of sector, when $r = 1.7$ cm, $\theta = 0.25$ radian.

(iii) Construct a circle with the help of given radius $r = 1.7$ cm.

(iv) Take any three non-collinear points P, Q, R and construct a circle passing through these points.

(v) Draw the box-and-whisker plot, if min. value = 12, max. value = 26, median = 19, $Q_1 = 14$ and $Q_3 = 24$.

(vi) Find the range of the data set: 63, 89, 98, 125, 79, 108, 117, 60

(vii) A librarian recorded the number of visitors during 5 days of a week: 120, 135, 130, 125, 140. Calculate the variance and standard deviation of visitors.

(viii) Find the probability of getting a sum of 5 or 7 in a throw of two dice.

(ix) If A and B are two mutually exclusive events of a random experiment and $P(\text{not } A) = 0.45$, $P(A \cup B) = 0.65$, then find $P(B)$.

(Part-II)

Note: Attempt any TWO questions from Q.5 to Q.7. Each part carries 4 marks. **(2 × 8 = 16)**

5: (a) Find the real and imaginary parts of the complex number $\left(\frac{2-i}{2+i}\right)^{-2}$. **(4)**

(b) Use quadratic formula to solve the equation: $\frac{3x-3}{x+1} = \frac{2x-1}{x-1}$, $x \neq -1, 1$ **(4)**

6: (a) Use Cramer's rule to solve the following pair of linear equations: $x + 2y = 7$, $3x - 2y = -3$ **(4)**

(b) The functions f and g are defined such that $f(x) = 4x + 2$ and $g(x) = 6x - 18$. (i) Find $f^{-1}(x)$ and $g^{-1}(x)$. (ii) Find x if $f^{-1}(x) = g^{-1}(x)$. **(4)**

7: (a) Solve the equation: $4x^4 - 27x^2 + 18 = 0$ **(4)**

(b) Solve the triangle ABC, in which $b = 4.8$ cm, $a = 4$ cm, $\beta = 71°$. **(4)**

(Part-III)

Note: Attempt any ONE question from Q.8 and Q.9. Each part carries 4 marks. **(1 × 8 = 8)**

8: (a) If $\underline{a} = 3\underline{i} - \underline{j}$, $\underline{b} = -2\underline{i} + 4\underline{j}$ and $\underline{c} = \underline{i} + 2\underline{j}$, then find unit vector parallel to $3\underline{a} - 2\underline{c} + 4\underline{b}$. **(4)**

(b) Machine A Output (units): 98, 100, 102, 101, 99. Machine B Output (units): 95, 100, 105, 90, 110. (i) Which machine has better performance? (ii) Which machine is more consistent? **(4)**

9: (a) Draw a circle of radius 1.5 cm and draw a tangent at point P, when P is at a distance of 8 cm from its centre. **(4)**

(b) A dice is rolled and coin is tossed together. (i) Find sample space by drawing possibility diagram. (ii) Find sample space by sketching tree diagram. (iii) What is a probability of getting a tail and an even number? **(4)**

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