Roll No. | | | | | |

INDIAN SCHOOL SALALAH

FINAL EXAMINATION-FEBRUARY 2026 (AY-2025-26)

MATHEMATICS (041)

Class: XI **Date: 11 -02-2026**

Time: 3 hours **Maximum Marks: 80**

General Instructions:

a) This Question paper contains - five sections A, B, C, D and E. Each section is compulsory. However, there are internal choices in some questions.

b) Section A has 18 MCQ's and 02 Assertion-Reason based questions of 1 mark each.

c) Section B has 5 Very Short Answer (VSA)-type questions of 2 marks each.

d) Section C has 6 Short Answer (SA)-type questions of 3 marks each.

e) Section D has 4 Long Answer (LA)-type questions of 5 marks each.

f) Section E has 3 source based/case based/passage based/integrated units of assessment of 4 marks each with sub-parts.

NO	SECTION A	MARKS
1	Given the sets A = {1, 2, 3}, B = {3, 4}, C = {4, 5, 6}, then $A \cup (B \cap C)$ is, (a) {1,2,3} (b) {1,2,3,4,5,6} (c) {3} (d) { 1,2,3,4}	1
2	Let A = {1, 2, 3, 4} then total number of subsets of A are , (a) 8 (b) 16 (c) 12 (d) 12	1
3	If A = {1, 3, 5, B} and B = {2, 4}, then: (a) $\{4\} \subset A$ (b) $4 \in A$ (c) $B \subset A$ (d) None of these	1
4	Let $n(A) = m$ and $n(B) = n$ then number of relations that can be defined from A to B is : (a) 2^{mn} (b) $n^m - 1$ (c) mn-1 (d) $2^{mn} - 1$	1

5	If $f(x) = (25 - x^4)^{1/4}$, $0 < x < \sqrt{5}$ then $f\left(f\left(\frac{1}{2}\right)\right)$ is , (a) 2^{-1} (b) 2^{-2} (c) 2^{-3} (d) 2^{-4}	1
6	The domain of the function $f : R \to R$ defined by $f(x) = \sqrt{x^2 - 4}$ is , (a) R (b) $[-2, 2]$ (c) $(-\infty, 2] \cup [2, \infty)$ (d) $(-\infty, \infty)$	1
7	If $\text{cosec}x = -\frac{2}{\sqrt{3}}$ and x lies in fourth quadrant then $\tan x =$ (a) $\sqrt{3}$ (b) $\frac{1}{\sqrt{3}}$ (c) $-\sqrt{3}$ (d) $\frac{-1}{\sqrt{3}}$	1
8	$\frac{1-\cos 2x+\sin x}{\sin 2x+\cos x} =$ (a) $\text{cosec}\, x$ (b) $\tan x$ (c) $\cot x$ (d) $\sec x$	1
9	The mean deviation from mean for the data 3, 6, 6, 8, 7, 11, 15,16 is (a) 2 (b) 2.75 (c) 3 (d) 3.75	1
10	The multiplicative inverse of $(3 + 2i)^2$ is, (a) $-\frac{4}{169} + \frac{12}{169}i$ (b) $\frac{5}{169} - \frac{12}{169}i$ (c) $\frac{-5}{169} + \frac{12}{169}i$ (d) $\frac{5}{169} + \frac{12}{169}i$	1
11	Solve the system of inequalities $x - 5 > 0$, $\frac{2x-4}{(x+2)} < 4$ (a) $x > 5$ (b) $x > 2$ (c) $x > -5$ (d) $x < -2$	1
12	In how many ways can a cricket team be chosen out of a batch of 15 players, if a particular player is always chosen? (a) 965 (b) 1364 (c) 1001 (d) 364	1
13	$\left(\sqrt{3}+1\right)^{2n} - \left(\sqrt{3}-1\right)^{2n}$ is , (a) an irrational number (b) an odd positive integer (c) an even positive integer (d) a negative integer	1

14	A word consists of 9 letters; 5 consonants and 4 vowels. Three letters are chosen at random. What is the probability that more than one vowel will be selected? (a) $\frac{9}{42}$ (b) $\frac{4}{9}$ (c) $\frac{17}{42}$ (d) $\frac{2}{9}$	1
15	Equations of diagonals of the square formed by the lines $x = 0, y = 0,$ x =1and y = 1 are, (a) $y = x, x + y = 2$ (b) $2y = x, x + y = \frac{1}{3}$ (c) $y = x, x + y = 1$ (d) $y = 2x, y + 2x = 1$	1
16	The coordinates of the foot of the perpendicular drawn from the point $(2, -3, 4)$ on the y-axis is: (a) $(-2, -3, -4)$ (b) $(0, -3, 0)$ (c) $(2, 3, 4)$ (d) $(2, 0, 4)$	1
17	$\lim_{x \to 0} \left(\frac{1-\cos 4x}{1-\cos 6x}\right)$ = (a) $\frac{1}{2}$ (b) $\frac{4}{9}$ (c) $-\frac{1}{2}$ (d) -1	1
18	If the sum of numbers obtained on throwing a pair of dice is 9, then the probability that number obtained on one of the dice is 4, is: (a) $\frac{1}{18}$ (b) $\frac{1}{2}$ (c) $\frac{4}{9}$ (d) $\frac{1}{9}$	1
	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.	

19	**Assertion(A):** The sum of first 6 terms of the GP 4, 16, 64, ... is equal to 5460. **Reason (R):** Sum of the first n terms of the G.P. is given by $S_n = \frac{a(1-r^n)}{1-r}$, $\|r\| < 1$	1
20	**Assertion(A) :** $\sin(x + y)\cos(x - y) - \cos(x + y)\sin(x - y) = \sin 2x$ **Reason(R) :** $\sin A \cos B - \cos A \sin B = \sin(A - B)$	1
	SECTION B	
21	**A)** Let $U = \{1,2,3,4,5,6,7,8,9,10\}$, P = {5, 6, 7, 8}, Q = {7, 8, 9, 10}, R = {3, 4, 5, 6}. Find: (a) $((P - Q) \cup R)'$ (b) $(P' \cup Q) \cap Z'$ **OR** **B)** Let $A = \{1,2,3,4,5\}$, $B = \{1,2,3,4,6,7,8\}$, $C = \{4,5,6,7,8\}$ then verify $A \cup (B \cap C) = (A \cup B) \cap (A \cup C)$	2 2
22	Let A = {2, 3, 4, 5} and B = {7, 9, 11, 13, 15, 17}. Define a relation R from A to B by: R = {(x, y) : x ∈ A, y ∈ B and y = 2x + 3}. (i) Write R in roster form. (ii) Find domain and range of R	2
23	Prove that $\sin(150 + x) + \sin(150 - x) = \cos x$.	2
24	A) How many numbers lying between 100 and 1000 can be formed with the digits 0, 1, 2, 3, 4, 5, if the repetition of the digits is not allowed? **OR** B) Find the value of *n* such that ${}^nP_5 = 42\ {}^nP_3, n > 4$	2
25	Evaluate $\lim_{x\to 0}\left(\frac{x}{1-\sqrt{1-x}}\right)$	2
	SECTION C	
26	A) i) If U = {1,2,3,4,……..,10} is the universal set for the sets P = {2,3,4,5} and Q = {1,2,3,4,5,6}, then verify that (P∪Q)' = P'∩Q'. ii) Let $f = \left\{\left(x, \frac{x^2}{1+x^2}\right) : x \in R\right\}$ be a function from R to R. Determine the range of f. **OR**	3

	B) i) Determine the domain and range of $f(x)=\frac{1}{\sqrt{x-6}}$ ii) Let A = {1,2}, B = {1,2,3,4}, C = {5,6} , then verify $A \times (B \cap C) = (A \times B) \cap (A \times C)$	3
27	Let $z_1 = 2 - i$ and $z_2 = -2 + i$. Find i) Re $\left(\frac{z_1 z_2}{\bar{z}_1}\right)$ ii) Im $\left(\frac{1}{z_1 \bar{z}_1}\right)$	3
28	Solve: $-2 - \frac{x}{4} \leq \frac{1+x}{3}$ and $3 - x < 4(x + 3)$ Show the graph of the solutions on number line.	3
29	A) Using Binomial theorem evaluate: $(97)^5$ **OR** B) By using binomial theorem expand the expression $\left(\frac{x}{3} - x\right)^6$.	3
30	A) Show that the path of a moving point such that its distances from two lines $3x - 2y = 5$ and $3x + 2y = 5$ are equal is a straight line. **OR** B) Find the equation of the line passing through the point of intersection of the lines $4x + 7y - 3 = 0$ and $2x - 3y + 1 = 0$ that has equal intercepts on the axes.	3 3
31	Show that the points P (–2, 3, 5), Q (1, 2, 3) and R (7, 0, –1) are collinear.	3
	SECTION D	
32	A) If cos $x = -\frac{3}{5}$, x lies in third quadrant, find the values of other five trigonometric functions. **OR** B) i) Find $4\sin\left(\frac{-\pi}{6}\right)\sec\left(\frac{\pi}{3}\right) + 3\operatorname{cosec}\left(\frac{5\pi}{6}\right)\tan\left(\frac{\pi}{4}\right) - \operatorname{cosec}\left(\frac{-\pi}{4}\right)\sec\left(\frac{\pi}{4}\right)$ ii) Prove that $\sin\left(x + \frac{\pi}{6}\right) - \sin\left(x - \frac{\pi}{6}\right) = \cos x$	5 5
33	If *a, b, c, d* are in G.P, prove that $(a^n + b^n), (b^n + c^n)$ and $(c^n + d^n)$ are in G.P.	5
34	A) i) Find $\frac{dy}{dx}$ if $y = \frac{x^2-1}{x+1}$ ii)Evaluate: $\lim_{x \to 2} \frac{3x^2-x+10}{x^2-4}$ **OR**	5

	B) i) Find the derivative of $f(x) = \frac{2-x^2}{1-x} + 2$ ii) Evaluate: $\lim_{x \to \frac{\pi}{2}} \frac{\tan 2x}{x - \frac{\pi}{2}}$	5
35	Calculate the mean, variance and standard deviation of the following data:	5

Class	0-20	20-40	40-60	60-80	80-100	100-120	120-140
Frequency	5	8	12	10	7	5	3

SECTION E

36 **Case Study.1:**

Ashish is writing examination. He is reading question paper during reading time. He reads

instructions carefully. While reading instructions, he observed that the question paper consists of 15 questions divided in to two parts - part I containing 8 questions and part II containing 7 questions.

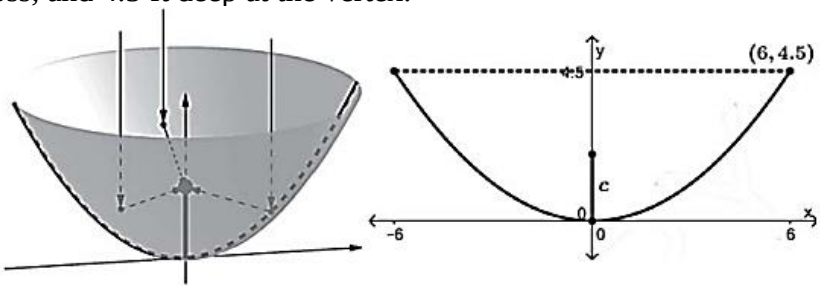
i) If Ashish is required to attempt 8 questions in all , selecting 4 from part I and 4 from part II then in how many ways can he select these questions. — 1

ii) If Ashish is required to attempt 8 questions in all ,selecting 3 from I part then in how many ways can he select these questions. — 1

iii) (a) If Ashish is required to attempt 8 questions in all, selecting at least 3 from each part, then in how many ways can he select these questions. — 2

OR

(b) If Ashish is required to attempt 8 questions in all ,selecting 6 from one section and remaining from another section, then in how many ways can he select these questions. — 2

37	**Case Study.2:** A satellite dish has a shape called a paraboloid, where each cross section is parabola. Since radio signals (parallel to axis) will bounce off the surface of the dish to the focus, the receiver should be placed at the focus. The dish is 12 ft across, and 4.5 ft deep at the vertex.  i) Name the type of curve given in the above paragraph and find the equation of curve? ii) Find the equation of parabola whose vertex is (0.0) and equation of directrix is $x = -4$. iii) (a) Find the equation of parabola Vertex (0, 0) passing through (2, 3) and axis is along x-axis. and also find the length of latus rectum. **OR** (b)Find focus, length of latus rectum and equation of directrix of the parabola $x^2 = 8y$.	1 1 2
38	**Case Study.3:** Four friends Dinesh, Yuvraj, Sonya, and Rajeev are playing cards. Dinesh, shuffling the cards and told to Rajeev choose any four cards.  i) What is the probability that Rajeev getting one card from each suit? ii) What is the probability that Rajeev getting two king and two Jack cards?	2 2

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