



INDIAN SCHOOL AL WADI AL KABIR

Revision Question Paper
2024-2025

Class: XI

Sub: MATHEMATICS (041)

Max Marks: 80

Date: 08/09/2024

Time: 3 hr

General Instructions:

1. This question paper is divided into 6 sections- A, B, C, D and E
2. Section A comprises of 20 MCQ type questions of 1 mark each.
3. Section B comprises of 5 Very Short Answer Type Questions of 2 marks each.
4. Section C comprises of 6 Short Answer Type Questions of 3 marks each.
5. Section D comprises of 4 Long Answer Type Questions of 5 marks each.
6. Section E comprises of 3 source based / case based / passage-based questions (4 marks each) with sub parts.
7. Internal choice has been provided for certain questions
8. This question paper contains 5 pages

SECTION – A

(Each MCQ Carries 1 Mark)

1	Let $S = \{x: x \text{ is a positive multiple of 3 less than } 100\}$ then $n(S)$ is			
	a) 30	b) 33	c) 31	d) 37
2	For any sets A and B, $n(A \cup B)' = 7$ then $n(A' \cap B')$ is			
	a) 3	b) 5	c) 7	d) 2
3	The interval for the set $\{x: x \in R, 0 \leq x < 6\}$ is			
	a) $[0,6]$	b) $(0,6]$	c) $(0,6)$	d) $[0,6)$
4	If $A = \{1,2\}$ and $B = \{3,4\}$ then the number of subsets of $A \times B$ is			
	a) 0	b) 16	c) 8	d) 4
5	If $f(x) = x^2$ then the value of $f(1.1) - f(1)$			
	a) 0.20	b) -0.21	c) 0.21	d) 2.1
6	What is the radian measure of a wheel's revolution in 1 second if it has 360 in 1 minute?			
	a) 12π	b) $\frac{2\pi}{3}$	c) 11π	d) 7π
7	If $\cot x = \frac{5}{12}$ x lies in the first quadrant then the value of $\sec x$ is equal to			
	a) $\frac{13}{5}$	b) $\frac{5}{13}$	c) $\frac{-13}{5}$	d) $-\frac{5}{13}$
8	The value of $\sin 105^\circ + \cos 105^\circ$ is			
	a) $\frac{1}{2}$	b) $\frac{1}{\sqrt{2}}$	c) $\frac{1}{3}$	d) $\frac{1}{\sqrt{3}}$
9	The value of $\sin 75^\circ$ is			
	a) $\frac{\sqrt{3}-1}{2\sqrt{2}}$	b) $\frac{1+\sqrt{3}}{2\sqrt{2}}$	c) $\frac{2\sqrt{2}}{1+\sqrt{3}}$	d) $\frac{2\sqrt{2}}{\sqrt{3}-1}$

10	The value of $(0 + i)^{923}$ is			
	a) i	b) $-i$	c) 1	d) -1
11	The modulus of $z = (1 + i)(2 + i)$			
	a) 10	b) 4	c) 2	d) $\sqrt{10}$
12	The conjugate of complex number $(1 + i)^2$			
	a) $2i$	b) $-2i$	c) i	d) $-i$
13	The solution of $4x + 3 < 6x + 7$ is			
	a) $(2, \infty)$	b) $(-2, \infty)$	c) $(-\infty, 2)$	d) $(-4, \infty)$
14	Rahul obtained 20 and 25 marks in first two tests. The minimum marks he should get in the 3 rd test to score the average of at least 30 marks is			
	a) $x \geq 35$	b) $x < 35$	c) $x \geq 45$	d) $x \leq 45$
15	The number of 6- digit number can be formed from the digits 0,1,3,5,7 and 9 which are divisible by 10 and no digit is repeated is			
	a) 120	b) 240	c) 2100	d) 200
16	The number of outcome in which a die is rolled six times is			
	a) 6^6	b) 2^6	c) $6!$	d) $2!$
17	The value of $\frac{7!}{5!} + \frac{5!}{3!}$ is			
	a) 60	b) 64	c) 62	d) 66
18	There are 5 men and 3 women in a family. The number of ways that we can select 2 men and 2 men to form a group is			
	a) 10	b) 30	c) 12	d) 6
	Directions: In the following 2 questions, a statement of Assertion (A) is followed by a statement of Reason (R). Mark the correct choice as. (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 and R is True			
19	Assertion (A): The number of selection of 20 things taken 8 at a time is same as that taken at 12 at a time Reason (R): ${}^nC_r = {}^nC_s$ if $n=r+s$			
	a)	b)	c)	d)
20	Assertion (A): The mean deviation of 3, 4, 5, 6, 7 is 1.2 Reason (R): Mean Deviation $= \frac{1}{n} \sum_{i=1}^n x_i - \bar{x} $			
	a)	b)	c)	d)
SECTION – B (Each Question Carries 2 Marks)				
21	Prove that $\sin(n+1)x \sin(n+2)x + \cos(n+1)x \cos(n+2)x = \cos x$			
22	(a) Express the complex number in the standard form $\left(-2 - \frac{i}{3}\right)^3$ - OR - (b) If $z = 2 + 3i$ then find the value of $z^2 - 4z + 13$			

23	Find all pairs of consecutive odd natural numbers, both of which are larger than 10, such that their sum is less than 40.
24	(a) Determine the value of n if ${}^{2n}C_3 : {}^nC_3 = 12:1$ - OR - (b) If the different permutations of all the letter of EXAMINATION are listed in the dictionary, how many words are there in the list before the first word starting with 'E'?
25	Find the variance for the following data: 6, 7, 10, 12, 13, 4, 8, 12.

SECTION – C
(Each Question Carries 3 Marks)

26	If $U = \{a, b, c, d, e, f, g, h\}$, $A = \{a, b, c\}$, $B = \{d, e, f, g\}$ and $C = \{a, c, e, g\}$ then find (i) $(A \cup B)'$ (ii) $(C - A)'$ (iii) $A \cap (B \cup C)$ (iv) $A - (B \cap C)$														
27	Check whether the following relations are functions or not. Give reason. (i) $R = \{(2,1), (3,1), (4,2)\}$ (ii) $R = \{(2,2), (2,4), (3,3), (4,4)\}$ (iii) $R = \{(1,3), (1,5), (2,5)\}$														
28	Prove that $\cos^2 x + \cos^2 \left(x + \frac{\pi}{3}\right) + \cos^2 \left(x - \frac{\pi}{3}\right) = \frac{3}{2}$ - OR - If $\tan x = \frac{3}{4}, \pi < x < \frac{3\pi}{2}$ find the value of $\sin \frac{x}{2}$ and $\cos \frac{x}{2}$														
29	Find the conjugate and modulus of the complex number $z = \frac{1+i}{i-1}$ - OR - If $(x + iy)^3 = u + iv$ then show that $\frac{u}{x} + \frac{v}{y} = 4(x^2 - y^2)$.														
30	a) What is the number of ways of choosing 4 cards from a deck of 52 playing cards? In how many of these (i) Four card of the same suit (ii) Four cards belong to four different suits (iii) Two are black cards and two are red cards - OR - b) If ${}^n P_5 = 42 {}^n P_3, n > 4$ then find n.														
31	Find the mean deviation about the mean for the following data: <table><tr><td>Marks</td><td>0 – 10</td><td>10 – 20</td><td>20 – 30</td><td>30 – 40</td><td>40 – 50</td><td>50 – 60</td></tr><tr><td>Number of Students</td><td>6</td><td>8</td><td>14</td><td>16</td><td>4</td><td>2</td></tr></table>	Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60	Number of Students	6	8	14	16	4	2
Marks	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50	50 – 60									
Number of Students	6	8	14	16	4	2									

SECTION – D
(Each Question Carries 5 Marks)

32	Let $U = \{x: -10 \leq x \leq 10\}$, $A = \{x: x \text{ is a positive integer and less than } 10\}$ and $B = \{x: x^2 + 7x - 8 = 0\}$ (i) Write the sets A and B in the roster form (ii) Find the complement of the sets A and B (iii) Show that $A = (A \cap B) \cup (A - B)$ (iv) Show that $A \cup (B - A) = A \cup B$
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33	Prove that: $\sin A + \sin B + \sin C = 4 \cos \frac{A}{2} \cos \frac{B}{2} \cos \frac{C}{2}$ - OR - Prove that: $\cos 2A + \cos 2B + \cos 2C = -1 - 4 \cos A \cos B \cos C$
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34	(a) Find the number of ways that the letters in the word ALGEBRA can be arranged in a row when (i) The two A's together (ii) The two A's not together (iii) The relative positions of the vowels and consonants are unaltered - OR - (b) A question paper has two parts A and B each containing 10 questions. If a student has to attend 8 questions, then find the number of ways when (i) No questions selected from part A (ii) Exactly two questions from part A (iii) At least three questions selected from part B
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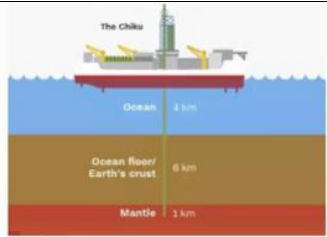
35

Calculate mean, variance and standard deviation for the following distribution

Classes	30 – 40	40-50	50-60	60-70	70-80	80-90	90-100
Number of Circles	3	7	12	15	8	3	2

SECTION – E
(CASE STUDY - Each Question Carries 4 Marks)

36	In a company, 100 employees offered to do a work. In out of them, 10 employees offered ground floor only, 15 employees offered first floor only, 10 employees offered second floor only, 30 employees offered second floor and ground floor to work, 25 employees offered first and second floor, 15 employees offered ground and first floor, 60 employees offered second floor. Based on the above information find the number of employees who offered	
	(i) all 3 floors (1m) (ii) ground floor (1 m) (iii) (a) ground floor and first floor but not second floor (2 m) - OR - (b) none of the three floors (2 m)	

37	Math teacher started the lesson Relations and functions in class XI. He explained the following topics: Ordered Pairs: The ordered pair of two elements a and b is denoted by (a, b) : a is first element and b is second element. Two ordered pairs are equal if their corresponding elements are equal. i.e., $(a, b) = (c, d) \Rightarrow a = c$ and $b = d$ Cartesian Product of Two Sets: For two non-empty sets A and B, the Cartesian Product $A \times B$ is the set of all ordered pairs of elements from sets A and B. In symbolic form, it can be written as $A \times B = \{(a, b) : a \in A, b \in B\}$. Based on the above topics answer the following questions.	
	(i) If $(a - 3, b + 7) = (3, 7)$, then find the value of a and b (1m) (ii) If $n(A) = 3$ and $n(B) = 4$ then write the number of relation from A to B (1m) (iii) (a) If $A = \{1, 2, 3, 4, 5, 6\}$ then write the subset of $A \times A$ given by $\{(x, y) : y \text{ is divisible by } x\}$ (2 m) -OR- (b) $R = \{(x, y) : 2x + 3y = 30 \text{ and } x, y \in W\}$ then write R in roster form (2m)	
38	As a result of scientific drilling project, it was found that the temperature T in degree Celsius, x km below from the surface was given by $T = 30 + 25(x - 3), 3 < x < 15$.	
	(i) If the required temperature lies between 200°C and 300°C then find the depth of the soil. (2m) (ii) Calculate the depth if $-9x + 2 > 18$ or $13x + 15 > 2$ (2m)	



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ANSWERS

1	b)33	5	c) 0.21	9	b) $\frac{1+\sqrt{3}}{2\sqrt{2}}$	13	b) $(-2, \infty)$
2	d) 7	6	a) 12π	10	b) $-i$	14	c) $x \geq 45$
3	d) $[0,6)$	7	a) $13/5$	11	d) $\sqrt{10}$	15	a)120
4	a) 4	8	b) $\frac{1}{\sqrt{2}}$	12	b) $-2i$	16	b) 2^6
17	c)62						
18	b)30						
19	(A) Both A and R are true and R is the correct explanation of A						
20	(C) A is true but R is false						
22	(a) $\frac{-22}{3} - i \frac{107}{27}$ OR 0						
23	(11, 13), (13, 15), (15, 17), (17, 19)						
24	(a) $n=5$ OR 907200						
25	9.25						
26	(i){h} (ii) { a, b, c, d, h} (iii) {a,c} (iv) {a, b, c}						
27	(i)R is a function (ii) not a function (iii) a function						
29	2						
30	(a) (i) 2860 (ii) 13^4 (iii) 105625 OR (b) $n=5$						
31	10.34						
32	(i) $A=\{0,1,2,..,10\}$ $B=\{-8,1\}$ (ii) $A'=\{-10,-9,..,-1\}$ $B'=\{-10,-9,-7,..,0,2,..,10\}$						
34	(a) (i)720 (ii) 1800 (iii) 72 OR (b) (i) 45						
35	Mean =62 Var=201 S.D=14.18						
36	(i)5 (ii) 50 (iii) (a) 10 or (b) 5						
37	(i) $A=6, b=14$ (ii) 12 (ii) $\{(1, 1), (1, 2), (1, 3), (1, 4), (1, 5), (1, 6), (2, 2), (2, 4), (2, 6), (3, 3), (3, 6), (4, 4), (5, 5), (6, 6)\}$						
38	(i) 9.8km and 13.8 km (i) $x<3$ and $x>-1$						