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Directorate of Education, GNCT of Delhi
Practice Paper (Mid-Term)
Session: 2026-27
CLASS – IX
SUBJECT – MATHEMATICS

Time Allowed: 3 hours

Maximum Marks: 80

सामान्य निर्देश:

1. इस प्रश्न पत्र में 38 प्रश्न हैं।
2. यह प्रश्न पत्र 5 खंडों 'क', 'ख', 'ग', 'घ' और 'ङ.' में विभाजित है।
3. खंड 'क' में प्रश्न संख्या 1-18 बहुविकल्पीय प्रश्न हैं और प्रश्न संख्या 19 और 20 प्रत्येक 1 अंक के अभिकथन-कारण आधारित प्रश्न हैं।
4. खंड 'ख' में, प्रश्न संख्या 21-25 अति लघु उत्तरीय प्रकार के प्रश्न हैं, प्रत्येक के लिए 02 अंक हैं।
5. खण्ड 'ग' में प्रश्न संख्या. 26-31 लघु उत्तरीय प्रकार के प्रश्न हैं, प्रत्येक के लिए 03 अंक हैं।
6. खण्ड 'घ' में प्रश्न संख्या. 32-35 दीर्घ उत्तरीय प्रकार के प्रश्न हैं, प्रत्येक के लिए 05 अंक हैं।
7. खण्ड 'ङ.' में प्रश्न संख्या. 36-38 प्रकरण आधारित प्रश्न हैं जिनमें से प्रत्येक में 4 अंक हैं और प्रत्येक के उप-भाग क्रमशः 1, 1 और 2 अंक हैं।
8. सभी प्रश्न अनिवार्य हैं। हालाँकि, खंड 'ख' के 2 प्रश्नों में, खंड 'ग' के 2 प्रश्नों में तथा खंड 'घ' के 2 प्रश्नों में एक आंतरिक विकल्प दिए गए हैं। अनुभाग 'ङ.' के सभी 2 अंक वाले प्रश्नों में एक आंतरिक विकल्प दिए गए हैं।
9. जहां भी आवश्यकता हो साफ-सुथरी आकृतियां बनाएं।
10. यदि दिया न गया हो, तो जहां आवश्यक हो वहां $\pi = 22/7$ प्रयोग कीजिए।
11. कैलकुलेटर का प्रयोग वर्जित है।
12. कृपया प्रश्न का उत्तर लिखने से पहले, प्रश्न का क्रमांक अवश्य लिखें।

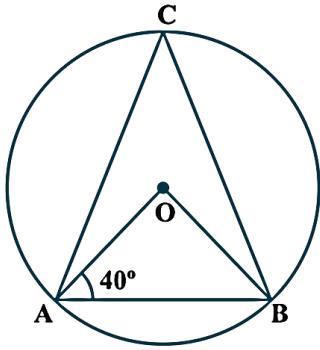
GENERAL INSTRUCTIONS:

1. This question paper contains 38 questions.
2. This question paper is divided into 5 Sections A, B, C, D and E.
3. In Section A, Questions no. 1-18 are multiple choice questions (MCQs) and questions no. 19 and 20 are Assertion- Reason based questions of 1 mark each.
4. In Section B, Questions no. 21-25 are very short answer (VSA) type questions, carrying 02 marks each.
5. In Section C, Questions no. 26-31 are short answer (SA) type questions, carrying 03 marks each.
6. In Section D, Questions no. 32-35 are long answer (LA) type questions, carrying 05 marks each.
7. In Section E, Questions no. 36-38 are case-study based questions carrying 4 marks each with sub parts of the values of 1, 1 and 2 marks each respectively.
8. All Questions are compulsory. However, an internal choice in 1 Question of Section B, 2 Questions of Section C and 2 Questions of Section D has been provided. An internal choice has been provided in all the 2 marks questions of Section E.
9. Draw neat and clean figures wherever required.
10. Take $\pi = 22/7$ wherever required if not stated.
11. Use of calculators is not allowed.
12. Please do write down the serial number of the questions before attempting it.

	<u>Section – A</u>		
	Section-A consists of 20 questions of 1 mark each. Select the most appropriate option from the given option.		
1.	In two-dimensional coordinate system, the coordinates of a point on the x-axis are of the form:		1
	(a) (x, 0)	(b) (0, y)	
	(c) (x, x)	(d) (–x, –x)	
2.	The distance of a point from the x-axis is a units and from y-axis is b units, then the coordinates of the point P are:		1
	(a) (a, b)	(b) (b, a)	
	(c) (a, a)	(d) (b, b)	
3.	The distance between the points (4, 3) and (–4, 3) is:		1
	(a) 4 units	(b) 6 units	
	(c) 8 units	(d) 14 units	
4.	If $(a - 3, b + 4) = (0, 0)$, then the value $\sqrt{a^2 + b^2}$ is:		1
	(a) 10	(b) – 3	
	(c) 16	(d) 5	
5.	The number of terms in the algebraic expression $4x + 5x - 3$ is:		1
	(a) 3	(b) 2	
	(c) 1	(d) 0	
6.	The length of a rectangle is $(x + 3)$ cm and breadth is $(x - 5)$ cm, then the expression for the perimeter of this rectangle (in cm) is:		1
	(a) $2x + 6$	(b) $2x - 10$	
	(c) $2x + 12$	(d) $2x - 4$	

7.	$x^2 + 5x^3 - 11x - 24$ is a polynomial of degree:		1
	(a) 1	(b) 2	
	(c) 3	(d) 11	
8.	The perimeter of a square is 'z' cm. If each side of this square is increased by 't' cm, then its new perimeter (in cm) will be:		1
	(a) $z + t$	(b) $4(z + t)$	
	(c) $z + 4t$	(d) $4z + t$	
9.	$\sqrt{289 - 25}$ is a/an:		1
	(a) Irrational Number	(b) Rational Number	
	(c) Cyclic Number	(d) Odd Number	
10.	The absolute value of a rational number x , denoted by $ x $, is always:		1
	(a) Non-negative	(b) Negative	
	(c) Zero	(d) Undefined	
11.	If $16a^2 - 121b^2$ represents the area of a rectangle (in square units), then possible expressions for the length and breadth for this rectangle are:		1
	(a) $(16a - 121b)$, $(16a + 121b)$	(b) $(4a - 11b)$, $(4a + 11b)$	
	(c) $(4a - b)$, $(4a + b)$	(d) $(2a - 11b)$, $(2a + 11b)$	
12.	On simplifying $(a - b + c)^2$, we get:		1
	(a) $a^2 + b^2 + c^2 - 2ab - 2bc - 2ca$	(b) $a^2 + b^2 + c^2 + 2ab + 2bc + 2ca$	
	(c) $a^2 + b^2 + c^2 - 2ab - 2bc + 2ca$	(d) $a^2 + b^2 + c^2 + 2ab - 2bc - 2ca$	
13.	The length of the longest chord of circle of radius 6.5 cm is:		1
	(a) 6.5 cm	(b) 12 cm	
	(c) 14.5 cm	(d) 13 cm	

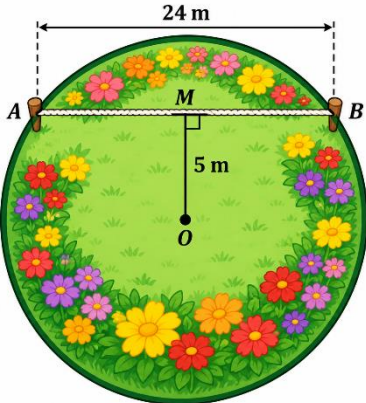
14.	The sides of a triangular plot are in the ratio 3: 5: 7; its perimeter is 600 m. Then, the length of its longest side (in m) is:		1
	(a) 100	(b) 120	
	(c) 200	(d) 280	
15.	A letter is picked at random from the word 'EXPERIMENTS'. The probability of picking the letter E is:		1
	(a) $\frac{4}{11}$	(b) $\frac{7}{11}$	
	(c) $\frac{3}{11}$	(d) 1	
16.	Two coins are tossed simultaneously. The total number of possible outcomes for this experiment are:		1
	(a) 2	(b) 4	
	(c) 6	(d) 8	
17.	The set of all possible outcomes of a random experiment is called:		1
	(a) An event	(b) The sample space	
	(c) The probability	(d) An experiment	
18.	If $u_n = (-1)^n \times (2n - 1)$, then the value of u_{55} is:		1
	(a) 55	(b) -55	
	(c) 109	(d) -109	
	Directions for Q 19 & 20:- There is one Assertion (A) and one Reason (R). Choose the correct answer of these questions from the four options (a), (b), (c) and (d) given below: (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation of the assertion (A). (b) Both Assertion (A) and Reason (R) are true but Reason (R) is not the correct explanation of the assertion (A). (c) Assertion (A) is true but reason (R) is false. (d) Assertion (A) is false but reason (R) is true.		
19.	Assertion (A): The number $0.\overline{7}$ is a rational number. Reason (R): Every number whose decimal expansion is non-terminating and recurring (repeating) can be expressed in the form $\frac{p}{q}$, where p and q are integers and $q \neq 0$.		1
20.	Assertion (A): There exists <i>no</i> irrational number between 1 and 2. Reason (R): An irrational number always exists between any two other irrational numbers.		1

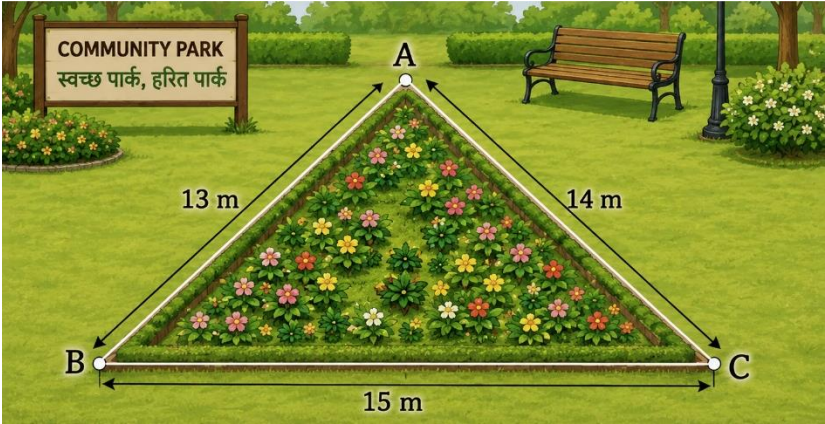
	<u>Section – B</u>	
	Section-B consists of 5 questions of 2 marks each.	
21.	An auto-rikshaw fare starts at ₹30 and remains the same for the initial 2 km. Then it increases by ₹15 per km. What will be the fare for a travel of 22 km?	2
22. (a)	Without performing division, determine whether the decimal expansion of $\frac{14}{625}$ is terminating or non-terminating. If it terminates, state the number of decimal places. OR	2
22. (b)	Find any two rational numbers between $\frac{1}{6}$ and $\frac{5}{8}$	
23. (a)	Find the value of $(149)^2$ using suitable identity. OR	2
23. (b)	Factorize: $49x^2 + 36y^2 - 84yx$	
24.	In the figure given below, if $\angle OAB = 40^\circ$, then find $\angle ACB$. 	2
25.	Find second and third term of the sequence given by the recursive rule $t_1 = 5, t_n = t_{n-1}(t_{n-1} - 5)$ for $n \geq 2$.	2
	<u>Section – C</u>	
	Section-C consists of 6 questions of 3 marks each.	
26.	Show that $0.142857142857... = \frac{1}{7}$	3
27. (a)	A school canteen recorded the number of students choosing different types of fruit during a day. The observations are given below:	3

	<table><tr><td>Fruit</td><td>Apple</td><td>Banana</td><td>Orange</td><td>Mango</td></tr><tr><td>Number of Students</td><td>25</td><td>35</td><td>20</td><td>20</td></tr></table> One student is selected at random. Find the probability that the selected student: (i) chose a banana. (ii) chose an apple or an orange. (iii) did not choose a mango. OR	Fruit	Apple	Banana	Orange	Mango	Number of Students	25	35	20	20					
Fruit	Apple	Banana	Orange	Mango												
Number of Students	25	35	20	20												
27. (b)	A recent survey found that the ages of female workers in a factory is distributed as follows: <table><tr><td>Age (in years)</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr><tr><td>Number of female workers</td><td>30</td><td>15</td><td>12</td><td>10</td><td>8</td><td>5</td></tr></table> If a female worker is selected at random, find the probability that the worker is: (i) 25 years old. (ii) 27 years old. (iii) more than 27 years old.	Age (in years)	25	26	27	28	29	30	Number of female workers	30	15	12	10	8	5	
Age (in years)	25	26	27	28	29	30										
Number of female workers	30	15	12	10	8	5										
28.	Find the coordinates of the point (i) which lies on the origin. (ii) whose ordinate is –10 and which lies on y-axis. (iii) whose abscissa is 15 and which lies on x-axis.	3														
29.	Simplify: $(x - 2y)^3 - (x + 2y)^3$	3														
30.	The diameter of a circle is 26 cm. A chord of length 24 cm is drawn in the circle. Find the distance from the centre of the circle to the chord.	3														
31. (a)	Using Heron’s formula, prove that the area of an equilateral triangle with side ‘$2a$’ units is $\sqrt{3}a^2$ units. OR	3														
31. (b)	The sides of a triangle are in the ratio 2: 3: 4, and its perimeter is 90 cm. Find its area.															

	<u>Section – D</u>											
	Section-D consists of 4 questions of 5 marks each.											
32.	A student is designing a square-shaped logo on a coordinate plane. The four vertices of the logo are A(2,1), B(−1,2), C(−2,−1), and D(1,−2). Using the given coordinates, answer the following: (a) Plot the points A, B, C, and D on the coordinate plane and join them in order. (2 marks) (b) Find the lengths of AB, BC, CD and DA using the distance formula. (1.5 mark) (c) Based on your findings, justify whether ABCD is a square. (1.5 marks)	5										
33.	How many 3-digit numbers are divisible by 5 leaving one remainder? What is the sum of all these 3-digit numbers? (2.5 + 2.5)	5										
34. (a)	An electric bulb manufacturing company records the life (in hours) of electric bulbs before fuse in 1000 cases. <table border="1"><tr><td>Life (in hours)</td><td>0 - 400</td><td>400 - 800</td><td>800 - 1200</td><td>1200-1600</td></tr><tr><td>Number of bulbs</td><td>20</td><td>210</td><td>325</td><td>445</td></tr></table> Find the probability that a randomly chosen electric bulb lasts: (i) Less than 400 hours. (1) (ii) Between 400 and 1200 hours. (2) (iii) More than 1200 hours. (2) OR	Life (in hours)	0 - 400	400 - 800	800 - 1200	1200-1600	Number of bulbs	20	210	325	445	5
Life (in hours)	0 - 400	400 - 800	800 - 1200	1200-1600								
Number of bulbs	20	210	325	445								
34. (b)	Mala has a box containing 4 red marbles, 5 black marbles and 3 green marbles. She picks a marble, without looking, from the box and put it back. Find the probability that the marble drawn is (i) Red in colour. (1) (ii) Either black or green in colour. (2) (iii)Neither red nor black in colour. (2)											

35. (a)	An architectural firm is designing a rectangular herbal garden for a new residential complex. Due to spatial constraints on the plot, the width of the garden must be 4 metres less than its length, and the total area occupied by the garden must be 96 sq. metres. Find the perimeter of the herbal garden. OR	5
35. (b)	A carpentry student is creating an algebraic mosaic board. To complete the panel, she arranges 2 large square tiles of side x units, 11 rectangular strips of length x units and width 1 unit, and 12 small square tiles of side 1 unit to form a single large rectangle without any overlaps. Find the length and breadth of the board in terms of x.	
	<u>Section – E</u>	
	Section-E consists of 3 questions of 4 marks each.	
36.	During the school Maths Mela, a student is given ₹100 as a starting amount to buy activity materials. She spends ₹10 every day on the materials. The amount of money left after x days can be represented by the expression: $A = 100 - 10x$	
	Based on above information, answer the following questions:	
	(i) What is the amount left after 3 days?	1
	(ii) Is $A = 100 - 10x$ a linear polynomial? Give a reason.	1
	(iii) (a) After how many days will the student have ₹40 left?	2

	OR	
	(iii) (b) Using $A=100 - 10x$, find the amount left after 6 days and explain whether this situation represents linear growth or linear decay.	2
37.	Students of Class 9 decorated a circular flower bed in the school garden for their Annual Sports Day. The centre of the circular bed is marked as O. Two pegs are fixed at points A and B on the boundary of the circle, connected by a straight string of length 24 m, forming a chord AB. The distance of this string AB from the centre O along a perpendicular line OM is 5 m.  Based on above information, answer the following questions:	
	(i) Find the radius of the circular flower bed.	1
	(ii) Another straight path CD is laid across the circular bed such that its perpendicular distance from the centre O is also 5 m. What is the length of path CD?	1
	(iii) (a) If the angle subtended by arc AB at the centre O is $\angle AOB = 120^\circ$, find the measure of the angle $\angle ACB$ subtended by the same arc at a point C on the remaining boundary of the circular bed. Give a valid reason for your answer.	2
	OR	
	(iii) (b) Four decorative lamps are placed at points A, B, D, and E on the circular boundary forming a cyclic quadrilateral ABDE. If $\angle ADE = 75^\circ$, find the measure of the opposite angle $\angle ABE$. Give a valid reason for your answer.	2

38.	A resident welfare association (RWA) designed a triangular flower bed in a community park to promote urban greenery. The three sides of the triangular plot measure 13 m, 14 m, and 15 m  Based on the above information, answer the following questions:	2
	(i) Calculate the semi-perimeter of the triangular plot.	1
	(ii) Find the total area of the triangular flower bed using Heron's formula.	1
	(iii) (a) Find the length of the altitude (height) corresponding to the longest side of the triangular plot.	2
	OR	
.	(iii) (b) The RWA decides to add organic manure over the entire area at ₹12 per m ² . Calculate the total expenditure required for the task.	2