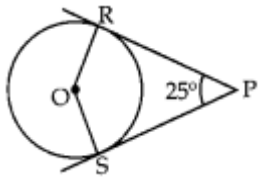
DELHI PUBLIC SCHOOL INDIRAPURAM, GHAZIABAD
PRACTICE TEST PAPER 2023-24

Time: 3 Hours	M. M.80	CLASS – 10 SUBJECT (MATHEMATICS)	No. of Q.: 38	No. of Pages :05
Name			Roll No.	

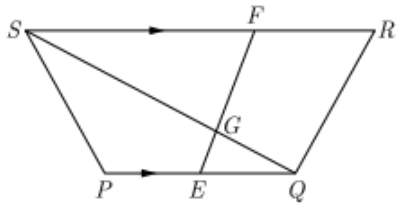
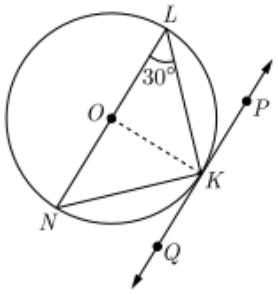
General Instructions :

1. This Question Paper has 5 Sections A-E.
2. Section A has 20 MCQs carrying 1 mark each
3. Section B has 5 questions carrying 02 marks each.
4. Section C has 6 questions carrying 03 marks each.
5. Section D has 4 questions carrying 05 marks each.
6. Section E has 3 case based integrated units of assessment (04 marks each) with sub-parts of the values of 1, 1and 2 marks each respectively.
7. All Questions are compulsory. However, an internal choice in 2 Qs of 5 marks, 2 Qs of 3 marks and 2 Questions of 2 marks has been provided. An internal choice has been provided in the 2marks question of Section E.
8. Draw neat figures wherever required. Take π = 22/7 wherever required if not stated.

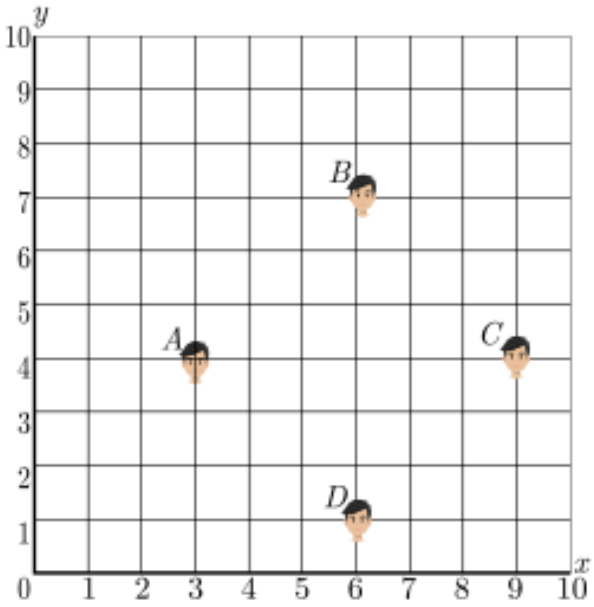
	SECTION -A	
1.	If two positive numbers m and n are expressible in the form $m=pq^3$ and $n=p^3 q^2$; p ,q being prime numbers, then HCF(m, n) is (i) pq (ii) pq^2 (iii) p^3q^2 (iv)p^2q^2	[1]
2.	Prime factors of the denominator of a rational number with decimal expansion 44.123 are (i) 2,3 (ii) 2,3,5 (iii) 2,5 (iv) 5,3	[1]
3.	If p and q are the zeroes of the polynomial x^2 -6x+k and 3p +2q=20, then the value of k is (i) -8 (ii) 16 (iii) -16 (iv) 8	[1]
4.	The value of k for which the system of equations $kx+y=k^2$ and x+ky=1 has infinitely many solutions, is (i) 1 (ii) 2 (iii) 3 (iv) 4	[1]
5.	If one root of the equation $3x^2$ =8x+(2k+1) is seven times the other, then the value of k is (i) 7/3 (ii) 5/3 (iii) -5/3 (iv) -7/3	[1]
6.	Δ ABC is such that AB=3cm, BC=2cm, CA=2.5cm. If ΔABC ~ ΔDEF and EF=4cm, then perimeter of Δ DEF is (i) 7.5cm (ii) 15cm (iii) 22.5cm (iv) 30cm	[1]
7.	The perimeter of the triangle with vertices (0,4), (0,0),(3,0) is (i) 5units (ii) 15units (iii) 12units (iv) 25units	[1]
8.	Two of the vertices of a Δ ABC are given by A(6, 4) and B(–2, 2) and its centroid is G(3, 4). Find the coordinates of the third vertex C of the ΔABC. (i) (2,3) (ii) (4,6) (iii) (4,3) (iv) (5,6)	[1]
9.	If $\sin\theta + \sin^2\theta = 1$, then $\cos^2\theta + \cos^4\theta$ = . (i) 1 (ii) 2 (iii) 3 (iv) 4	[1]
10.	If sinA=x and cosA=y ,then tanA is equal to (i) xy (ii) x/y (iii) y/x (iv) 1/xy	[1]
11.	If x tan 45° sin 30° = cos 30° tan 30°, then x is equal to (i) √3 (ii) 1/2 (iii) 1/ √2 (iv) 1	[1]
12.	In the given figure, if ∠RPS = 25°, the value of ∠ROS is	[1]

<table>
<tr><td></td><td> 

(i) 135° (ii) 145° (iii) 155° (iv) 165°</td><td></td></tr>
<tr><td>13.</td><td>The length of the minute hand of a clock is 14 cm. The area swept by the minute hand in 5 minutes is
(i) 153.9 sqcm (ii) 102.6sqcm (iii) 51.3sqcm (iv) 205.2sqcm</td><td>[1]</td></tr>
<tr><td>14.</td><td>A cylinder and a cone are of same base radius and of same height. The ratio of the volume of the cylinder to that of the cone is
(i) 1:2 (ii) 3:1 (iii) 1:3 (iv) 2:1</td><td>[1]</td></tr>
<tr><td>15.</td><td>The volume of a sphere is 4851 cm^3. Its diameter is
(i) 3.5cm (ii) 7cm (iii) 14cm (iv) 21cm</td><td>[1]</td></tr>
<tr><td>16.</td><td>In the given data, the difference between the upper limit of the median class and the lower limit of the modal class is
<table>
<tr><th>C. I.</th><th>Frequency</th></tr>
<tr><td>65-85</td><td>4</td></tr>
<tr><td>85-105</td><td>5</td></tr>
<tr><td>105-125</td><td>13</td></tr>
<tr><td>125-145</td><td>20</td></tr>
<tr><td>145-165</td><td>14</td></tr>
<tr><td>165-185</td><td>7</td></tr>
<tr><td>185-205</td><td>4</td></tr>
</table>
(i) 38 (ii) 20 (iii) 19 (iv) 0</td><td>[1]</td></tr>
<tr><td>17.</td><td>One of the methods for determining mode is
(i) Mode = 2 Median -3 Mean (ii) Mode = 3 Median -3 Mean
(iii) Mode = 3 Median -2 Mean (iv) 2Mode = 3 Median - Mean</td><td>[1]</td></tr>
<tr><td>18</td><td>Cards marked with numbers 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from this box randomly, then the probability that the number on card is a perfect square.
(i)9/100 (ii) 3/10 (iii) 19/100 (iv)1/10</td><td>[1]</td></tr>
<tr><td>19</td><td>DIRECTION: In the question number 19 and 20, a statement of assertion (A) is followed by a statement of reason (R).
Choose the correct option
Question. Statement A (Assertion); : The HCF of two numbers is 5 and their product is 150, then their LCM is 30
Statement R (Reason); For any two positive integers a and b,HCF(a, b)+LCM (a, b) =a b
(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A).
(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).
(c) Assertion (A) is true but reason (R) is false.
(d) Assertion (A) is false but reason (R) is true.</td><td>[1]</td></tr>
<tr><td>20.</td><td>Question. Statement A (Assertion);if the coordinates of the mid-points of the sides AB and AC of triangle ABC are D(3,5) and E(-3, -3) respectively, then BC=20 units.
Statement R (Reason); The line joining the mid-points of two sides of a triangle is parallel to the third side and is equal to half of it.</td><td>[1]</td></tr>
</table>

	(a) Both assertion (A) and reason (R) are true and reason (R) is the correct explanation of assertion (A). **(b) Both assertion (A) and reason (R) are true but reason (R) is not the correct explanation of assertion (A).** **(c) Assertion (A) is true but reason (R) is false.** **(d) Assertion (A) is false but reason (R) is true.**	
	SECTION-B	
21.	**Solve for x and y: 49x+51y=499 and 51x+49y=501**	**[2]**
22.	In the figure, $PQRS$ is a trapezium in which $PQ \| \| RS$. On PQ and RS, there are points E and F respectively such that EF intersects SQ at G. Prove that $EQ \times GS = GQ \times FS$.  **OR** **In an equilateral triangle of side 12 cm, find the length of the altitude.**	**[2]**
23.	Evaluate : $\dfrac{3\tan^2 30^\circ + \tan^2 60^\circ + \operatorname{cosec} 30^\circ - \tan 45^\circ}{\cot^2 45^\circ}$	**[2]**
24.	In figure, O is the centre of the circle and LN is a diameter. If PQ is a tangent to the circle at K and $\angle KLN = 30^\circ$, find $\angle PKL$. 	**[2]**
25.	**The wheels of a car are of diameter 80 cm each. How many complete revolutions does each wheel make in 10 minutes when the car is travelling at a speed of 66 km per hour?** **OR** **A chord of a circle of radius 10cm subtends a right angle at the centre. Find the area of the corresponding minor segment.(take π=3.14)**	**[2]**
	SECTION-C	
26.	**Prove that the reciprocal of $3+2\sqrt{2}$ is irrational , if given that $\sqrt{2}$ is irrational.** **OR** **Floor of a room is to be fitted with square marble tiles of the largest possible size. The size of the room is 10 m × 7 m. What should be the size of tiles required that has to be cut and how many such tiles are required?**	**[3]**
27.	**Compute the zeroes of the polynomial $4x^2 - 4x - 8$. Also, establish a relationship between the zeroes and coefficients.**	**[3]**
28.	**The sum of a two digit number and the number formed by interchanging the digit is 132. If 12 is added to the number, the new number becomes 5 times the sum of the digits, find the number.** **OR** **If twice the son's age in years is added to the father's age, the sum is 70. But if twice the**	**[3]**

	father's age is added to the son's age , the sum is 95. Find the ages of father and son.	
29.	**Prove that $(\sin^8 A - \cos^8 A) = (\sin^2 A - \cos^2 A)(1 - 2\sin^2 A \cos^2 A)$**	**[3]**
30.	**If a hexagon ABCDEF circumscribes a circle, prove that AB+CD+EF=BC+DE+FA** **OR** **Prove that lengths of tangents to a circle from the same external point are equal.**	**[3]**
31.	**Peter throws two different dice together and finds the product of the two numbers obtained. Rina throws a die and squares the number obtained. Write the probability to find who has the better chance to get the number 25?**	**[3]**
	SECTION -D	
32.	**A two-digit number is such that the product of its digits is 14. If 45 is added to the number, the digits interchange their places. Find the number.** **OR** **The perimeter of a rectangular field is 82 m and its area is $400m^2$. Find the breadth of the rectangle.**	**[5]**
33.	**State and prove Thales theorem. Using the same solve the following.** **In Δ ABC, D and E are points on sides AB and AC respectively such that BD=CE. If ∠B=∠C, show that DE is parallel to BC.**	**[5]**
34.	**There are two spheres of same metal weighing 1kg and 7kg. The radius of the smaller sphere is 3 cm. The two spheres are melted to form a single sphere. Find the diameter of the new sphere.** **OR** **Water in a canal, 6 m wide and 1.5 m deep, is flowing with a speed of 10 km/h. How much area will it irrigate in 30 minutes, if 8 cm of standing water is needed?**	**[5]**
35.	**The median of the following data is 28.5. Find the values of x and y, if the total frequency is 60.** **Class interval / Frequency** **0-10 — 5** **10-20 — x** **20-30 — 20** **30-40 — 15** **40-50 — y** **50-60 — 5**	**[5]**
	SECTION – E	
36.	Arc of a Baby Swing : When Mackenzie's baby swing is started, the first swing (one way) is a 30 inch arc. As the swing slows down, each successive arc is 1.5 inch less than the previous one. (i) Write the A.P. formed. (ii) Find the length of the tenth swing. (iii) Find the total number of swings when it comes to rest. OR (iii) How far Mackenzie has travelled during the 10 swings ?	**[1]** **[1]** **[2]**
37.	Have you noticed that in school assembly you always stand in row and column and this make a coordinate system. Suppose a school have 100 students and they all assemble in prayer in 10 rows as given below. Here A B, ,C and D are four friend Amar, Bharat, Colin and Dravid.	



(i) What is the distance between A and B ? **[1]**

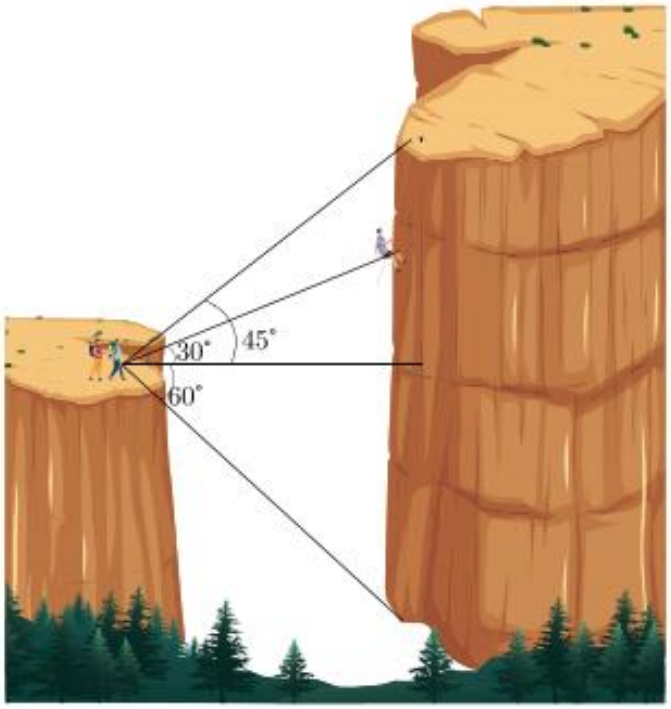
(ii) What is the coordinates of mid- point of the distance between C and D ? **[1]**

(iii) What is the perimeter of the figure formed by the polygon ABCD ? **[2]**

OR

(iii) What is the area of the figure formed by the polygon ABCD?

38. Height of a Climber : Himalayan Trekking Club has just hiked to the south rim of a large canyon, when they spot a climber attempting to scale the taller northern face. Knowing the distance between the sheer walls of the northern and southern faces of the canyon is approximately 150 meter, they attempt to compute the distance remaining for the climbers to reach the top of the northern rim. They sight an angle of depression of 60^0 to the bottom of the north face, and angles of elevation of 30^0 and 45^0 to the climbers and top of the northern rim respectively.



(i) How high is the southern rim of the canyon? **[1]**

(ii) How high is the northern rim? **[1]**

(iii) How much farther until the climber reaches the top? **[2]**

OR

(iii) What is the distance between the observer and the top of the hill opposite to him?