

Roll No.

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Candidates must write the Set No. on the title page of the answer book.

DAV PUBLIC SCHOOLS, ODISHA ZONE
PERIODIC ASSESSMENT – II (2023 – 24)

- Please check, this question paper contains 6 printed pages.
- Set number given on the right hand side of the question paper should be written on the title page of the answer book by the candidate.
- Check that this question paper contains 38 questions.
- Write down the serial number of the question in the left side of the margin before attempting it.
- 15 minutes time has been allotted to read the question paper. The question paper will be distributed 15 minutes prior to the commencement of the examination. The students will read the question paper only and will not write any answer on the answer script during this period.

CLASS – X

SUBJECT – MATHEMATICS (BASIC)

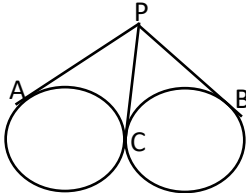
Time: 3 Hours.

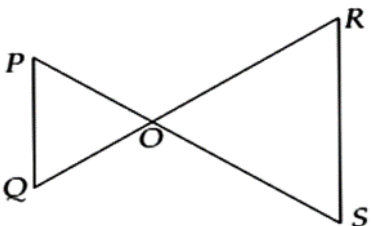
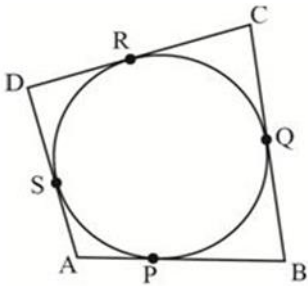
Maximum Marks: 80

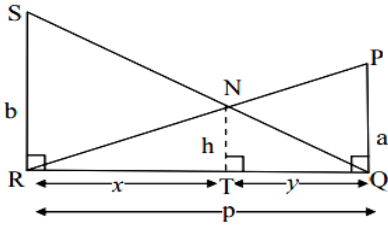
General Instructions:

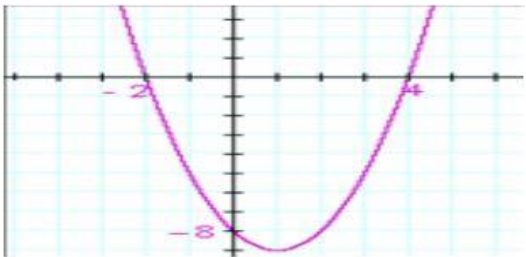

1. This Question Paper has 5 Sections A-E.
2. Section **A** has 20 MCQs carrying 1 mark each.
3. Section **B** has 5 questions carrying 02 marks each.
4. Section **C** has 6 questions carrying 03 marks each.
5. Section **D** has 4 questions carrying 05 marks each.
6. Section **E** has 3 casebased integrated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

SECTION – A

Q.No.	Consists of 20 questions of one mark each	Mark(s)
1	Find the LCM of 12, 15 and 21. a) 420 b) 12 c) 15 d)21	1
2	A quadratic polynomial, whose zeroes are -3 and 4 , is (a) $x^2 - x + 12$ (b) $x^2 + x + 12$ (c) $\frac{x^2}{2} - \frac{x}{2} - 6$ (d) $2x^2 + 2x - 24$	1
3	The value of 'k' for which the system of equations has unique solution $2x - 3ky + 2 = 0$ $x + 3y - 1 = 0$ (a) Any real value other than 2 (b) Any real value other than -2 (c)2 (d) -2	1
4	If a pair of linear equations is consistent, then the lines will be (a) parallel (b) always coincident (c) intersecting or coincident (d) always intersecting	1
5	If $\sin A = 1/2$ is true, then value A is (a) 0° (b) 30° (c) 45° (d) 60°	1
6	Find the length of the tangent drawn from a point 5 cm away from the center of a circle of radius 4cm. (a) 3 cm (b) 4cm (c) 5cm(d) none of these	1
7	The probability of getting 3 when a dice rolled once is (a) 1 (b) 0 (c) 1/6(d) 2/6	1
8	Find the area of sector of a circle of radius 21 cm if angle of the sector is 60° . (a) 211cm^2 (b) 30 cm^2 (c) 230 cm^2 (d) 231 cm^2	1
9	In the figure , PA, PB and PC are tangents to two circles touching each other externally at C. Which one is not true?  (a) $PA = PB$ (b) $PA = PC$ (c) $PC = PB$ (d) $PA = 4\text{ cm}$	1
10	A coin was tossed 3 times. Find the probability of getting exactly 2 heads. (a) $\frac{3}{7}$ (b) $\frac{3}{4}$ (c) $\frac{3}{8}$ (d) none of these	1
11	In ΔABC , D and E are points on AB and AC such that $DE \parallel BC$. IF $AD = 2\text{ cm}$, $DB = 4\text{cm}$, $AE = 2\text{ cm}$, find EC? (a) 6 cm (b) 5cm(c)3 cm (d) 4 cm	1
12	The radius of a circle whose area 154 cm^2 is (a) 7 cm(b) 15cm(c) 13 cm (d) 12 cm	1
13	In ΔABC and ΔDEF , $\angle B = \angle E$, $\angle F = \angle C$ and $\angle A = \angle D$ Then, the two triangles are (a) congruent (b) similar (c) neither congruent nor similar (d) congruent as well as similar	1

14	For a certain distribution, $\sum f_i = 18$ and $\sum f_i x_i = 54$. the mean is. (a) 6 (b) 5 (c)3 (d) 2	1
15	The value of $\sin^2 A + \cos^2 A$ is (a) 0 (b)1/2 (c) 1 (d) $\frac{\sqrt{3}}{2}$	1
16	The value of $\tan 45^\circ$ is (a)3 (b) 1 (c) 2 (d) 0	1
17	The length of arc of a circle of radius 63 cm ,if it makes 120° at the centre is (a) 240 cm (b) 140 cm (c) 132 cm (d) 242 cm	1
18	What is the empirical relationship between mean, median and mode? (a) $3\text{mean} = \text{mode} + 2\text{median}$ (b) $2\text{mean} = \text{mode} + 3\text{median}$ (c) $3\text{median} = 2\text{mean} + \text{mode}$ (d) $3\text{mode} = \text{mean} + 2\text{median}$	1
19	Assertion (A): $\sqrt{3}$ is an Irrational number. Reason (R): The square of a prime number is irrational. (a) Both Assertion (A) and Reason (R) are true and Reason (R) is the correct explanation for Assertion (A). (b) Both Assertion (A) and Reason (R) are true and Reason (R) is not the correct explanation for Assertion (A). (c) Assertion (A) is true and Reason (R) is false. (d) Assertion (A) is false and Reason (R) is true.	1
20	Assertion: If the sum of the zeroes of the quadratic polynomial $x^2 - 2kx + 8$ is 2 then value of k is 1. Reason: Sum of zeroes of a quadratic polynomial $ax^2 + bx + c$ is $-b/a$ (a) Both A and B are true and R is the correct explanation of A. (b) Both A and B are true and R is not the correct explanation of A. (c) A is true but R is false (d) A is false but R is true	1
SECTION – B		
21	If $PQ \parallel RS$, prove that $\triangle POQ \sim \triangle SOR$ 	2
22	A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$ 	2

23	<p>If $\sin A = 4/5$. Then find the value of $\cos A + \tan A$</p> <p style="text-align: center;">OR</p> <p>Evaluate $\frac{\sin 30^\circ + 2\cos^2 45^\circ + \tan^2 60^\circ}{\frac{1}{2}\cot 45^\circ + \cos^2 30^\circ + \tan^2 45^\circ}$</p>	2												
24	<p>Find out the probability that a number selected at random from the numbers 1, 2, 3,.....,15 is a multiple of 4 .</p> <p style="text-align: center;">Or</p> <p>One card is drawn from a well shuffled deck of 52 cards. Find the probability of getting a black king.</p>	2												
25	<p>If $4 \tan \theta = 3$, then find the value of $\frac{4\sin\theta - \cos\theta}{4\sin\theta + \cos\theta}$</p>	2												
SECTION – C														
26	<p>There is a circular path around a sports field. Sonia takes 18 minutes to drive one round of the field, while Ravi takes 12 minutes for the same. Suppose they both start at the same point and at the same time, and go in the same direction. After how many minutes will they meet again.</p>	3												
27	<p>Find the zeroes of the polynomial $x^2 - 6x + 5$.</p> <p style="text-align: center;">Or</p> <p>If α and β are the zeroes of the quadratic polynomial $x^2 - 5x + a$ and product of zeroes is zero . Find a.</p>	3												
28	<p>The sum of the digits of a two-digit number is 9. Also, nine times this number is equal to twice the number obtained by reversing the order of the digits. Find the number.</p>	3												
29	<p>Prove the given identity: $\frac{\tan A}{1 + \sec A} - \frac{\tan A}{1 - \sec A} = 2 \operatorname{cosec} A$</p> <p style="text-align: center;">Or</p> <p>Prove that: $\frac{\tan \theta + \sec \theta - 1}{\tan \theta - \sec \theta + 1} = \frac{1 + \sin \theta}{\cos \theta}$</p>	3												
30	<p>Prove that length of two tangents drawn from an exterior point to a circle are equal.</p>	3												
31	<p>50 students enter for a school javelin throw competition. The distance in meters of thrown are recorded as below. Find the mode of the given data.</p> <table border="1" data-bbox="248 1395 1318 1480" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="padding: 5px;">Distance in meters</th> <th style="padding: 5px;">0–20</th> <th style="padding: 5px;">20–40</th> <th style="padding: 5px;">40–60</th> <th style="padding: 5px;">60–80</th> <th style="padding: 5px;">80–100</th> </tr> </thead> <tbody> <tr> <td style="padding: 5px;">No. of students</td> <td style="padding: 5px;">6</td> <td style="padding: 5px;">11</td> <td style="padding: 5px;">17</td> <td style="padding: 5px;">12</td> <td style="padding: 5px;">4</td> </tr> </tbody> </table>	Distance in meters	0–20	20–40	40–60	60–80	80–100	No. of students	6	11	17	12	4	3
Distance in meters	0–20	20–40	40–60	60–80	80–100									
No. of students	6	11	17	12	4									
SECTION –D														
32	<p>Prove that $\sqrt{2}$ is an irrational number. Hence show that $3\sqrt{2}-5$ is irrational number</p>	5												
33	<p>State and prove Basic proportionality theorem.</p> <p style="text-align: center;">OR</p> <p>Two poles of height "a" metres and "b" metres are "p" metres apart. Prove that ,</p> <p style="text-align: center;">$NT = \frac{ab}{a+b}$ metres.</p> <div style="text-align: center;">  </div>	5												

<p>34</p>	<p>The coach of a cricket team buys 4 bats and 1 ball for Rs. 2050. Later, she buys 3 bats and 2 balls for Rs. 1600. Find the cost of each bat and each ball.</p> <p style="text-align: center;">Or</p> <p>A lending library has a fixed charge for the first three days and an additional charge for each day thereafter. Saritha paid Rs. 27 for a book kept for seven days, while Susy paid Rs. 21 for the book she kept for five days. Find the fixed charge and the charge for each extra day.</p>	5														
<p>35</p>	<p>The median of the following data is 28.5. Find the value of x & y, if the total frequency is 60.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td>CI</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>frequency</td> <td>5</td> <td>x</td> <td>20</td> <td>15</td> <td>y</td> <td>5</td> </tr> </table>	CI	0-10	10-20	20-30	30-40	40-50	50-60	frequency	5	x	20	15	y	5	5
CI	0-10	10-20	20-30	30-40	40-50	50-60										
frequency	5	x	20	15	y	5										
SECTION – E																
<p>36</p>	<p>CASE STUDY – 1 Observe the graph answer the questions</p>  <p>(a) How many zeroes are there for the polynomial whose graph is given above? (b) What are the zeroes of the polynomial whose graph is given above? (c) Write the polynomial whose zeroes are $2\sqrt{3}$ and $\sqrt{3}$</p> <p style="text-align: center;">Or</p> <p>Find the zeroes of the polynomial $x^2 - 1$?</p>	4														
<p>37</p>	<p>CASE STUDY - 2 On a weekend Rani was playing cards with her family. The deck has 52 cards. If her brother drew one card.</p>  <p>(a) What is the probability of getting a red queen? (b) What is the probability of getting a face card? (c) What is the probability of getting either a king or a spade?</p> <p style="text-align: center;">or</p> <p>What is the probability of getting neither a king nor a jack?</p>	4														

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CASE STUDY – 3

A silver brooch is in the shape as shown in the adjoining figure where silver wire is used in preparing the circle of radius 7cm and the five diameters.

- (a) Find out the sector angle for each sector.
- (b) Find out the arc length of each sector.
- (c) Find the length of wire used in brooch.

OR

Find the area of each sector.



4
