ROLL NO._____ SeriesJPR_PBI/25-26/10/241/SET-I

CLASS:X **Subject: Mathematics Basic (241)**

Time :3 hours MaximumMarks:80

NOTE:-

- Please check that this question paper contains 6 printed pages.
- Please check that this question paper contains 38 questions.
- Please write down the serial number of the question in the answer-book before attempting it.
- 15 minutes time has been allotted to read the question paper. The students will read the question paper only and will not write any answer on the answer-book during this period.

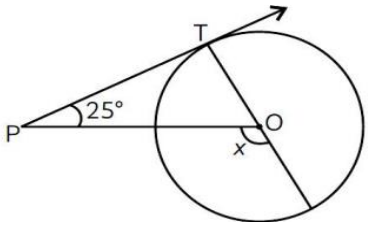
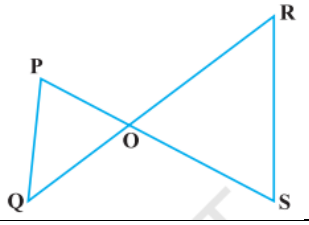
General Instructions:

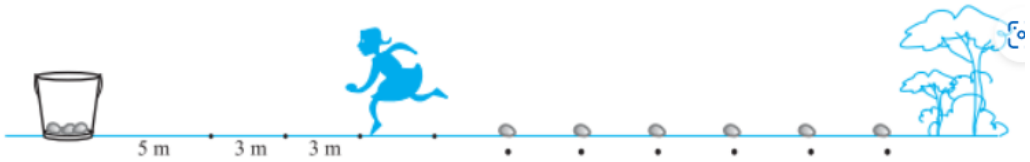
Read the following instructions very carefully and strictly follow them:

1. This Question paper contains 38 questions. All questions are compulsory.
2. This Question paper is divided into five Sections - A, B, C, D and E.
3. In Section A, Questions no. 1 to 18 are multiple choice questions (MCQs) with only one correct option and Questions no. 19 and 20 are Assertion-Reason based questions of 1 mark each.
4. In Section B, Questions no. 21 to 25 are Very Short Answer (VSA)-type questions, carrying 2 marks each.
5. In Section C, Questions no. 26 to 31 are Short Answer (SA)-type questions, carrying 3 marks each.
6. In Section D, Questions no. 32 to 35 are Long Answer (LA)-type questions, carrying 5 marks each.
7. In Section E, Questions no. 36 to 38 are Case study-based questions, carrying 4 marks each.
8. There is no overall choice. However, an internal choice has been provided in 2 questions in Section B, 2 questions in Section C, 2 questions in Section D and one subpart each in 2 questions of Section E.
9. Use of calculator is not allowed.

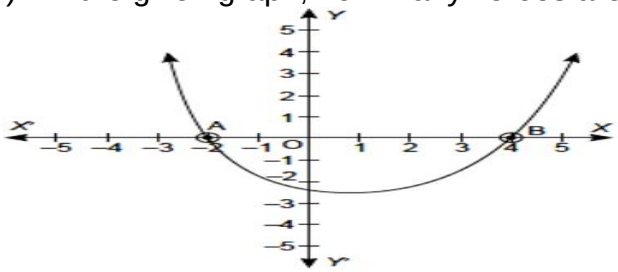
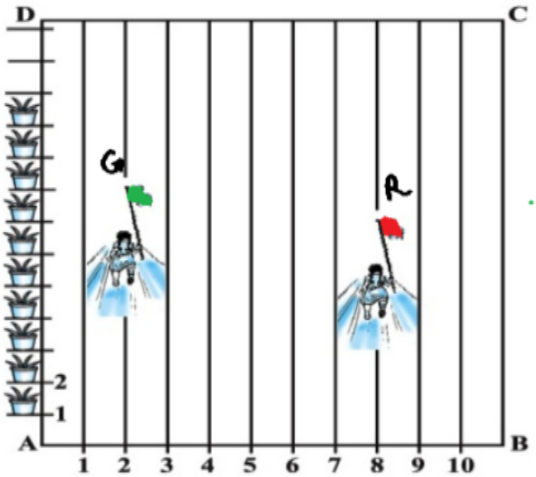
	Section- A	
	Section A consists of 20 questions of 1 mark each	
1	If two positive integers A and B can be expressed as $a = xy^3$ and $b = x^4y^2z$; x, y being prime numbers then HCF (a, b) is (A) xy^2 (B) x^4y^2z (C) x^4y^3 (D) x^4y^3z	1
2	The value of k for which the system of equations 2x-ky=7 and 4x+6y=10 is inconsistent is (A) 3 (B) -5 (C) 10 (D) -3	1
3	Which of the following cannot be the probability of an event? (A)98% (B) 1.2 (C) 0.001 (D) 11/12	1
4	30^{th} term of the A.P: 10,7,4..., is	1

	(A) 97 (B) 77 (C) - 77 (D) -87	
5	Solution of pair of liner equation of two variable 3x+4y=7 and 2x-2y=2 is (A)x=11/7,y=4/7 (B) x=-3/7, y=4/7 (C) x=3/7,y=-4/7 (D) x=-3/7,y=- 4/7	1
6	The point (-4,0) , (4,0), (0,3) are vertices of a which triangle (A) right triangle (B) scalene (C) equilateral (D) isosceles	1
7	If 2cosA=1, then coast- secA is equal to (A) 3/2 (B) -2/3 (C) $\sqrt{3}$ (D) -3/2	1
8	If the length of the shadow of a vertical pole is equal to its height, the angle of elevation of SUN's altitude is (A) 60^0 (B) 30^0 (C) 45^0 (D) 90^0	1
9	If in △ABC and △ EDF, $\frac{AB}{DE} = \frac{BC}{FD}$, they will be similar, when (A) ∠B = ∠D (B) ∠A= ∠D (C) ∠B= ∠E (D) ∠A= ∠F	1
10	What is the value of p if quadratic equation $2x^2 – 4x+p$ have real and equal roots? (A) -2 (B) 4 (C) -4 (D) 2	1
11	The quadratic polynomial whose sum and product of zeroes are –3 and 8 respectively is (A) $x^2 + 3x +8$ (B) $x^2 - 3x +8$ (C) $x^2 - 3x –8$ (D) $- x^2 + 3x +8$	1
12	The LCM of x and 18 is 36. The HCF of x and 18 is 2. What is the number x? (A)1 (B) 2 (C) 3 (D) 4	1
13	Volumes of two spheres are in the ratio 27: 64. The ratio of their surface areas is: (A) 9 : 16 (B) 4 : 3 (C) 3 : 4 (D) 16 : 9	1
14	The ratio in which (4,5) divides the join of (2,3) and (7,8) is (A) -2 : 3 (B) -3 : 2 (C) 3 :2 (D) 2 :3	1
15	A line that intersects the circle exactly at two distinct point is (A) tangent (B) chord (C) secant (D) diameter	1
16	2 cubes each of volume $125cm^3$ are joined end to end. What is the surface area of the resulting cuboid. (A) $125\ cm^2$ (B) $250cm^2$ (C) $375\ cm^2$ (D) $500cm^2$	1
17	The mean and mode of a data are 24 and 12 respectively, then its median is (A) 25 (B) 18 (C) 20 (D) 22	1
18	The length of the minute hand of a clock is 7 cm. What is the area swept by the minute hand in 30 minutes? (A) $154cm^2$ (B) $38.5cm^2$ (C) $118.5cm^2$ (D) $77cm^2$	1
	Direction: In the question number 19 and 20, a statement of Assertion(A) is followed by Reason(R). Choose the correct option 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 and 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	
19	Assertion (A): If LCM of two numbers is 2475 and their product is 14850 then their HCF is 5. Reason (R) : HCF(a,b) x LCM(a,b) = a x b	1

20	Assertion (A): The length of the tangent PT drawn an external point P to a circle is 24cm.If the distance between the point P and the Centre O of the circle is 25cm., then the length of a diameter of a circle is 14 cm. Reason (R): A tangent to a circle is perpendicular to the radius through the point of contact.	1
	Section B	
	Section B consists of 5 questions of 2 marks each.	
21	Find the probability that a number is multiple of 8 lies between 1 to 100. OR Two coins are tossed simultaneously. Find the probability of getting (a) At least one tail. (b) exact two head	2
22	Evaluate $\frac{5\cos^2 60° + 4\sec^2 30° - \tan^2 45°}{\sin^2 30° + \cos^2 30°}$	2
23	In the given figure, PT is a tangent at T to the circle with Centre O. If ∠TPO = 25°, then find x  OR Prove that the tangents drawn at the ends of a diameter of a circle are parallel.	2
24	The King, Queen and Jack of club cards removed from a deck of 52 playing cards and the remaining cards are shuffled. A card is drawn from the remaining cards. Find probability of getting. (a) A card of club (b) a face card	2
25	In figure, if PQ ∥ RS, prove that △POQ ~ △SOR  	2
	Section- C	
	Section C consists of 6 questions of 3 marks each.	
26	A leading library has a fixed charge for the first three days and 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 and the charge for each extra day.	3
27	Prove that $\sqrt{3}$ is an irrational number.	3
28	If $\cot(A+B) = \frac{1}{\sqrt{3}}$ and $\cot(A-B)=\sqrt{3}$, $0^0 < A+B \leq 90^0$, $A > B$, Find A and B OR $(\text{Sin } A + \text{Cosec } A)^2 + (\text{Cos } A + \text{Sec } A)^2 = 7 + \tan^2 A + \cot^2 A$	3
29	Prove that the parallelogram circumscribing a circle is rhombus.	

<table>
<tr><td>30</td><td>To warn ships for underwater rocks, a lighthouse spreads a red colored light over a sector of angle 80^0 to a distance of 16.5 km. Find the area of the sea cover which the ships are warned. (use π=3.14)
OR
In a circle of radius 21cm, an arc subtends an angle of 60^0 at the Centre. Find (I) the length of arc (ii) area of the segment formed by the corresponding chord</td><td>3</td></tr>
<tr><td>31</td><td>If α and β are roots of quadratic equation $x^2 - 7x + 10 = 0$, find the quadratic equation whose roots are α^2 and β^2.</td><td>3</td></tr>
<tr><td></td><td>Section- D</td><td></td></tr>
<tr><td></td><td>Section D consists of 4 questions of 5 marks each</td><td></td></tr>
<tr><td>32</td><td>From the top of a 7m high building angle of elevation of the top of a cable tower is 60^0 and the angle of depression of its foot is 45^0. Determine the height of the tower.</td><td>5</td></tr>
<tr><td>33</td><td>In a potato race, a bucket is placed at the starting point, which is 5 m from the first potato, and the other potatoes are placed 3m apart in a straight line. There are ten potatoes in the line (see Fig)
 

A competitor starts from the bucket, picks up the nearest potato, runs back with it , drops it in the bucket, runs back to pick up the next potato, runs the bucket to drop it in, and she continuous in the same way until all the potatoes are in the bucket. What is the total distance the competitor has to run?
OR
The sum of four consecutive number in A.P is 32 and the ratio of the product of the first and last terms to the product of two middle terms is 7:15. Find the numbers.</td><td>5</td></tr>
<tr><td>34</td><td>Prove that if a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points, the other two sides are divided in the same ratio.</td><td>5</td></tr>
<tr><td>35</td><td>If the median of the distribution given 28.5. Find the value of X and Y
<table>
<tr><td>Class interval</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><td>total</td></tr>
<tr><td>frequency</td><td>5</td><td>X</td><td>20</td><td>15</td><td>Y</td><td>5</td><td>60</td></tr>
</table>
OR
The following table gives the state-wise teacher- students ratio in the higher secondary schools of India. Find the mean and mode of this data.
<table>
<tr><td>CI</td><td>15-20</td><td>20-25</td><td>25-30</td><td>30-35</td><td>35-40</td><td>40-45</td><td>45-50</td><td>50-55</td></tr>
<tr><td>fi</td><td>3</td><td>8</td><td>9</td><td>10</td><td>3</td><td>0</td><td>0</td><td>2</td></tr>
</table></td><td>5</td></tr>
<tr><td></td><td>Section -E</td><td></td></tr>
<tr><td></td><td>Section E consists of 3 case study-based questions of 4 marks each.</td><td></td></tr>
<tr><td>36</td><td>Basketball and soccer are played with a spherical ball. Even though an athlete dribbles the ball in both sports, a basketball player uses his hands and a soccer player uses his feet. Usually, soccer is played</td><td></td></tr>
</table>

	outdoors on a large field and basketball is played indoor on a court made out of wood. The projectile (path traced) of soccer ball and basketball represents quadratic polynomial.   Based on the above, answer the following questions: (I) Name of the shape of the path traced shown (II) In the given graph, how many zeroes are there for the polynomial?  (iii) Write the expression for polynomial so formed. OR (iii) If 2 and –5 are the zeroes, then write the expression for quadratic polynomial.	1 1 2 2
37	In order to conduct Sports Day activities in your School, lines have been drawn with chalk powder at a distance of 1 m each, in a rectangular shaped ground ABCD, 100 flowerpots have been placed at a distance of 1 m from each other along AD, as shown in given figure below. Niharika runs 1/4 th the distance AD on the 2nd line and posts a green flag. Preet runs 1/5 th distance AD on the eighth line and posts a red flag.  Based on the above, answer the following questions: (I) Find the position of green flag. (ii) Find the position of red flag (iii) What is the distance between both the flags? OR (iii) If Rashmi has to post a blue flag exactly halfway between the line segment joining the two flags, where should she post her flag?	1 1 2 2

38	The word ‘circus’ has the same root as ‘circle’. In a closed circular area, various entertainment acts including human skill and animal training are presented before the crowd  A circus tent is cylindrical up to a height of 4 m and conical above it. The diameter of the base is 14 m and total height of tent is 28 m. Based on the above, answer the following questions: (I) Find slant height of the conical part. (ii) Determine the floor area of the tent. (iii) Find area of the cloth used for making tent. OR (b) Find total volume of air inside an empty tent	1 1 2 2