

PREBOARD EXAMINATION

Session: 2021 -22

Mathematics Basic (241)

Class: X

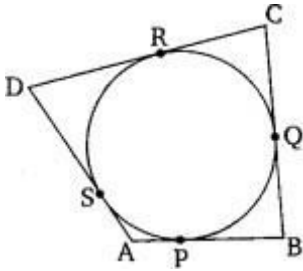
Max. Marks: 40

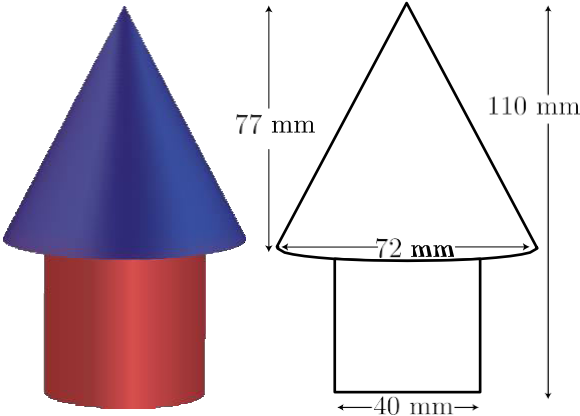
Duration: 2 Hours

GENERAL INSTRUCTIONS:

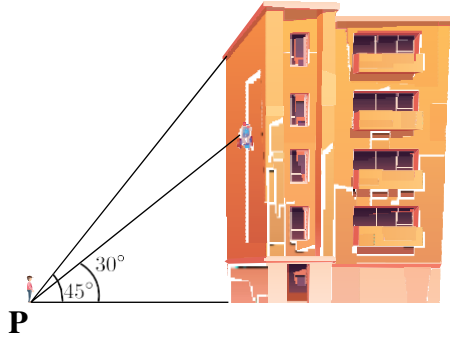
1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions.
3. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
4. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study-based questions.

SECTION A		MARKS														
Q. NO.																
1.	Find two numbers whose sum is 27 and product is 182.	2														
2.	From a solid cylinder whose height is 2.4cm and diameter 1.4cm, a conical cavity of the same height and same diameter is hollowed out. Find the total surface area of the remaining solid to the nearest cm^3	2														
3.	<p>The following data gives information on the observed lifetimes (in hours) of 225 electrical components. Determine the modal lifetimes of the components.</p> <table border="1" style="margin-left: auto; margin-right: auto; border-collapse: collapse;"> <thead> <tr> <th style="text-align: center;">Life times (in hours)</th> <th style="text-align: center;">Frequency</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">0 – 20</td> <td style="text-align: center;">10</td> </tr> <tr> <td style="text-align: center;">20 – 40</td> <td style="text-align: center;">35</td> </tr> <tr> <td style="text-align: center;">40 – 60</td> <td style="text-align: center;">52</td> </tr> <tr> <td style="text-align: center;">60 – 80</td> <td style="text-align: center;">61</td> </tr> <tr> <td style="text-align: center;">80 – 100</td> <td style="text-align: center;">38</td> </tr> <tr> <td style="text-align: center;">100 – 120</td> <td style="text-align: center;">29</td> </tr> </tbody> </table>	Life times (in hours)	Frequency	0 – 20	10	20 – 40	35	40 – 60	52	60 – 80	61	80 – 100	38	100 – 120	29	2
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4.	<p>Find the 11th term from the last term of the AP: 10, 7, 4, , - 62.</p> <p style="text-align: center;">OR</p> <p>How many two-digit numbers are divisible by 3?</p>	2														

5.	<p>If a tower 30m high, casts a shadow $10\sqrt{3}$ m long on the ground, then what is the angle of elevation of the sun?</p> <p style="text-align: center;">OR</p> <p>The angle of depression of a car, standing on the ground, from the top of a 75m high tower is 30°. Determine the distance of the car from the base of the tower.</p>	2
6.	<p>The length of a tangent from a point A at distance 5cm from the center of the circle is 4 cm. Find the radius of the circle.</p>	2
SECTION B		
7.	<p>A well of diameter 3 m is dug 14 m deep. The earth taken out of it has been spread evenly all around it in the shape of a circular ring of width 4 m to form an embankment. Find the height of the embankment.</p>	3
8.	<p>In a class test, the sum of Sneha's marks in Science and Social Science is 30. Had she got 2 marks more in Science and 3 marks less in Social Science, the product of their marks would have been 210. Find her marks in two subjects.</p> <p style="text-align: center;">OR</p> <p>Find the root of the given quadratic equation: $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$, $x \neq -4, 7$</p>	3
9.	<p>A straight highway leads to the foot of a tower. A man standing at the top of the tower observes a car at an angle of depression of 30°, which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be 60°. Find the time taken by the car to reach the foot of the tower from this point.</p>	3
10.	<p>A quadrilateral ABCD is drawn to circumscribe a circle. Prove that $AB + CD = AD + BC$.</p> <div style="text-align: center;">  </div>	3
SECTION C		
11.	<p>Draw a line segment of 12cm and divide it in the ratio 4:5.</p> <p style="text-align: center;">OR</p> <p>Draw a line segment AB of length 8 cm. Taking A as center, draw a circle of radius 4 cm and taking B as center, draw another circle of radius 3 cm. Construct tangents to each circle from the center of the other circle.</p>	4

<p>12.</p>	<p>The following table shows the ages of the patients admitted in a hospital during a year Find the mode and the mean of the data given above. Compare and interpret the two measures of central tendency.</p> <table border="1" data-bbox="517 465 1152 797"> <thead> <tr> <th>Age (in years)</th> <th>No. of patients</th> </tr> </thead> <tbody> <tr> <td>5 – 15</td> <td>6</td> </tr> <tr> <td>15 – 25</td> <td>11</td> </tr> <tr> <td>25 – 35</td> <td>21</td> </tr> <tr> <td>35 – 45</td> <td>23</td> </tr> <tr> <td>45 – 55</td> <td>14</td> </tr> <tr> <td>55 – 65</td> <td>5</td> </tr> </tbody> </table>	Age (in years)	No. of patients	5 – 15	6	15 – 25	11	25 – 35	21	35 – 45	23	45 – 55	14	55 – 65	5	<p>4</p>
Age (in years)	No. of patients															
5 – 15	6															
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45 – 55	14															
55 – 65	5															
<p>13.</p>	<p>In a toys manufacturing company, wooden parts are assembled and painted to prepare a toy. For the wood processing activity center, the wood is taken out of storage to be sawed, after which it undergoes rough polishing, then is cut, drilled and has holes punched in it. It is then fine polished using sandpaper. For the retail packaging and delivery activity center, the polished wood sub-parts are assembled together, then decorated using paint. One specific toy is in the shape of a cone mounted on a cylinder. The total height of the toy is 110 mm and the height of its conical part is 77 mm. The diameters of the base of the conical part is 72 mm and that of the cylindrical part is 40 mm. On the basis of the above information, answer the following questions:</p>															
																
<p>13-i</p>	<p>If its cylindrical part is to be painted red, Find the Surface area.</p>	<p>2</p>														
<p>13-ii</p>	<p>How much of the wood have been used in making the toy?</p>	<p>2</p>														

14. Ravish got a clinometer from school lab and started the measuring elevation angle in surrounding. He saw a building on which society logo is painted on wall of building.



From a point P on the ground level, the angle of elevation of the roof of the building is 45° . The angle of elevation of the center of logo is 30° from same point. The point P is at a distance of 24 m from the base of the building. On the basis of the above information, the following questions:

14 – i_	What is the height of the building logo from ground?	2
14- ii	What is the height of the building from ground?	2
