

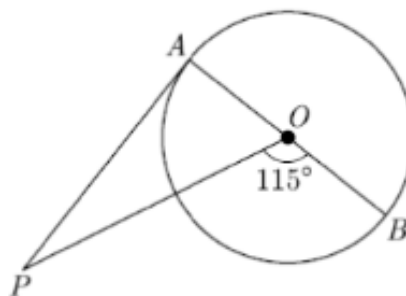
Time: 3 Hours

Maximum Marks: 80

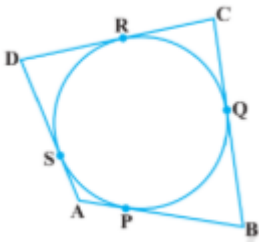
General Instructions:

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 case based integrated units of assessment (04 marks each) with sub parts of the values 1, 1 and 2 marks each respectively.
7. All questions are compulsory. However internal choice in 2 questions of 5 marks, 2 questions of 3 marks and 2 questions of 2 marks has been provided. An internal choice has been provided in 2 marks questions of section E.
8. Draw neat figures wherever required. Take $\pi = \frac{22}{7}$, wherever required if not stated.

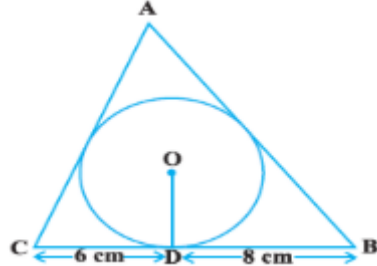
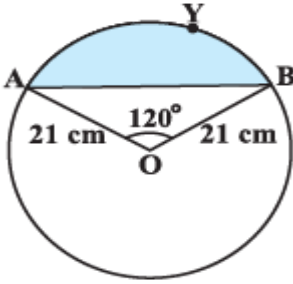
Q. No.	SECTION-A	Marks
1.	The LCM of smallest two-digit composite number and smallest composite number is : a) 12 b) 4 c) 20 d) 44	1
2.	The total number of factors of a prime number is a) 1 b) 2 c) 3 d) 4	1
3.	The LCM of two prime numbers p and q ($p > q$) is 221. Find the value of $3p - q$ a) 4 b) 28 c) 38 d) 48	1
4.	The graph of a polynomial $P(x)$ cuts the X- axis at 3 points and touches it at 2 other points. The number of zeroes of $P(x)$ is : a) 4 b) 2 c) 3 d) 5	1
5.	If 5 is a zero of the quadratic polynomial, $x^2 - kx - 15$, then the value of k is a) -2 b) 2 c) 1 d) -1	1
6.	If α and β are the roots of $4x^2 + 3x + 7 = 0$, then the value of $\frac{1}{\alpha} + \frac{1}{\beta}$ is a) $\frac{3}{4}$ b) $-\frac{3}{4}$ c) $\frac{4}{3}$ d) $-\frac{4}{3}$	1
7.	The value of k for which the lines $5x + 7y = 3$ and $15x + 21y = k$ coincide is : a) 9 b) 5 c) 7 d) 18	1
8.	The common difference of an AP, whose n^{th} term is $a_n = 3n + 7$ is a) 3 b) 2 c) 0 d) 4	1
9.	In a ΔABC , D and E are points on the sides AB and AC respectively such that $DE \parallel BC$. If $AD = 6\text{cm}$, $DB = 9\text{cm}$ and $AE = 8\text{cm}$, find AC a) 12 b) 8 c) 10 d) 20	1
10.	Two concentric circles are of radii 10 cm and 8 cm, then the length of the chord of the larger circle which touches the smaller circle is (a) 6 cm (b) 12 cm (c) 18 cm (d) 9 cm	1
11.	In the given figure, PA is a tangent from an external point P to a circle with centre O. If $\angle POB = 115^\circ$, then value of $\angle APO$ is (a) 25° (b) 20° (c) 30° (d) 65°	1



12.	The value of θ for which $\cos (10^\circ + \theta) = \sin 30^\circ$, is (a) 50° (b) 90° (c) 30° (d) 45°	1
13.	The two side AB and BC of right triangle ABC are in the ratio 1 : 3 . What will be the value of $\sin C$? (a) $3/10$ (b) $1/\sqrt{10}$ (c) $1/3$ (d) 1	1
14.	The area of the square that can be inscribed in a circle in a circle of radius 8cm is : a) 256cm^2 b) 64 cm^2 c) 128 cm^2 d) 32 cm^2	1
15.	Two right circular cones have their heights in the ratio 1 : 3 and radii in the ratio 3 : 1 . What is the ratio of their volumes? a) 9 : 1 b) 1:3 c) 2 ; 3 d) 3 : 1	1
16.	For a frequency distribution, mean, median and mode are connected by the relation (a) Mode = 3 Mean – 2 median (b) Mode = 2 median - 3 Mean (c) Mode = 3median -2 Mean (d) Mode = 3 median + 2 Mean	1
17.	If $P(E) = 0.007$, then what is the probability of ‘not E’? (a) 0.93 (b) 0.095 (c) 0.890 (d) 0.993	1
18.	If two dice are thrown, the probability of getting sum as 3 will be (a) $1/18$ (b) $2/3$ (c) $5/36$ (d) $1/36$	1
19.	Assertion: D and E are points on sides AB and AC of triangle ABC such that $AD=(7x-4)$ cm , $AE=(5x-2)$ cm, $DB=(3x+4)$ cm and $EC= 3x$ cm. if $DE \parallel BC$, then $x=4$ Reason: If a line is drawn parallel to one side of a triangle to intersect the other two sides in distinct points then the other two sides are divided in the same ratio. (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	1
20.	Assertion: If S_n is the sum of the first n terms of an A.P., then its nth term a_n is given by $a_n = S_n - S_{n-1}$. Reason : The 10th term of the A.P. 5, 8, 11, 14, is 35 (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 reasons (R) is false. (d) Assertion (A) is false but reason (R) is true	
SECTION - B		
21.	Find the value of k such that the polynomials $x^2 - (k + 6) x + 2(2k - 1)$ has sum of its zeros equal to half of their product.	2
22.	In what ratio does the point $(24/11, y)$ divide the line segment joining the point P (2, -2) and Q (3, 7) ? Also find the value of y.	2

23.	D is a point on the side BC of a triangle ABC such that $\angle ADC = \angle BAC$. Show that $CA^2 = CB \cdot CD$	2
24.	<p>A quadrilateral ABCD is drawn to circumscribe a circle as in figure.</p>  <p>Prove that $AB + CD = AD + BC$</p> <p>OR</p> <p>Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line-segment joining the points of contact at the centre.</p>	2
25.	<p>If $\sin \theta + \cos \theta = \sqrt{2}$, then prove that $\tan \theta + \cot \theta = 2$.</p> <p>OR</p> <p>Prove that: $(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$.</p>	2

SECTION-C

26.	Prove that $\sqrt{7}$ is an irrational number.	3
27.	Sum of the areas of two squares is 157 m^2 . If the sum of their perimeters is 68 m. Find the sides of two squares.	3
28.	<p>A triangle ABC is drawn to circumscribe a circle of radius 4 cm such that the segments BD and DC into which BC is divided by the point of contact D are of lengths 8 cm and 6 cm respectively.</p>  <p>Find the sides of AB and AC</p>	3
29.	If $\sin A = 3/4$, Calculate $\cos A$ and $\tan A$.	3
30.	<p>In a circle of radius 21 cm, an arc subtends an angle of 60° at the centre. Find: (i) the length of the arc (ii) area of the segment formed by the corresponding chord</p> <p>OR</p> <p>Find the area of the segment AYB shown in below figure, if radius of the circle is 21 cm and $\angle AOB = 120^\circ$.</p> 	3

31.	<p>One card is drawn from a well-shuffled pack of 52 playing cards. Find the probability of getting</p> <p>i) A king of black colour ii) Either a red card or a Jack iii) Not a face card</p> <p style="text-align: center;">OR</p> <p>Two dice are thrown at the same time. Find the probability of getting</p> <p>(i) Even number on both dice (ii) The sum of the two numbers appearing on the top of the dice is 7. (iii) The sum of the two numbers appearing on the top of the dice is prime number.</p>	3
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SECTION-D

32.	<p>A train covered a certain distance at a uniform speed. If the train would have been 6 km/h faster, it would have taken 4 hours less than the scheduled time and if the train were slower by 6 km/h , it would have taken 6 hours more than the scheduled time. Find the length of journey.</p> <p style="text-align: center;">OR</p> <p>Draw the graph of $2x + y = 6$ and $2x - y + 2 = 0$. Shade the region bounded by these lines and x- axis. Find the area of the shaded region.</p>	5
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33.	<p>A solid toy is in the form of a hemisphere surmounted by a right circular cone of same radius. The height of the cone is 10cm and the radius of the base is 7cm. Determine the volume of the toy. Also find the area of the coloured sheet required to cover the toy.(Use $\pi=22/7$ and $\sqrt{149}=12.2$)</p>	5
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34.	<p>The angles of depression of the top and the bottom of an 8 m tall building from the top of a multistoried building are 30° and 45°, respectively. Find the height of the multistory building and the distance between the two buildings.</p> <p style="text-align: center;">OR</p> <p>From the top of a 7 m high building, the angle of elevation of the top of a cable tower is 60° and the angle of depression of its foot is 45°. Determine the height of the tower.</p>	5
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35.	<p>The median of the following data is 525. Find the values of x and y, if the total frequency is 100.</p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <thead> <tr> <th>Interval</th> <th>0-100</th> <th>100-200</th> <th>200-300</th> <th>300-400</th> <th>400-500</th> <th>500-600</th> <th>600-700</th> <th>700-800</th> <th>800-900</th> <th>900-1000</th> </tr> </thead> <tbody> <tr> <td>Frequency</td> <td>2</td> <td>5</td> <td>X</td> <td>12</td> <td>17</td> <td>20</td> <td>Y</td> <td>9</td> <td>7</td> <td>4</td> </tr> </tbody> </table>	Interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000	Frequency	2	5	X	12	17	20	Y	9	7	4	5
Interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000														
Frequency	2	5	X	12	17	20	Y	9	7	4														

SECTION-E

36.	<p>In the month of April to June 2022, the exports of passenger cars from India increased by 26% in the corresponding quarter of 2021–22, as per a report. A car manufacturing company planned to produce 1800 cars in 4th year and 2600 cars in 8th year. Assuming that the production increases uniformly by a fixed number every year.</p>	1+1+2
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Based on the above information answer the following questions.

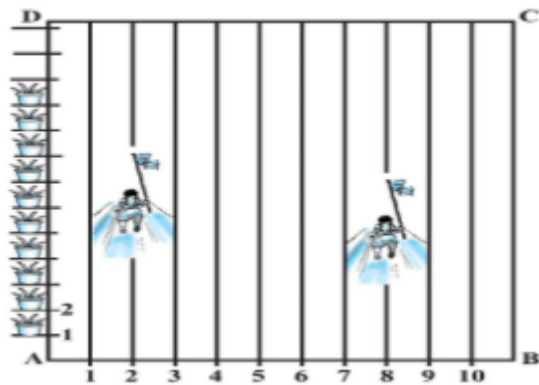
- (i) Find the production in the 1st year. (1 mark)
- (ii) Find the production in the 12th year. (1 mark)
- (iii) Find the total production in first 10 years. (2 marks)

OR

- (iii) In how many years will the total production reach 31200 cars? (2 marks)

- 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 flower pots have been placed at the distance of 1 m from each other along AD, as shown in the following figure. Niharika runs $(1/4)$ th distance AD on the 2nd line and posts a green flag. Preet runs $(1/5)$ th distance AD on the eighth line and posts are red flags. Taking A as the origin AB along x-axis and AD along y-axis, answer the following questions:

1+1+2



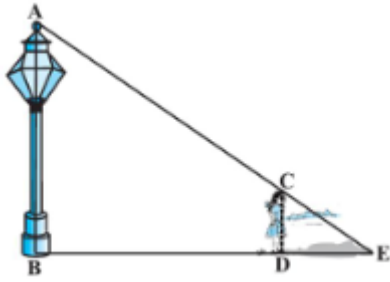
- (i) Find the coordinates of the green flag. (1 mark)
- (ii) Find the distance between the two flags. (1 mark)
- (iii) If Rashmi has to post a blue flag exactly halfway between the line segments joining the two flags, where should she post her flag? (2 marks)

OR

- (iii) If Joy has to post a flag at one fourth distance from the green flag, in the line segment joining the green and red flags, then where should he post his flag? (2 marks)

- 38.** On one day, a poor girl of height 90 cm is looking for a lamp-post for completing her homework as in her area power is not there and she finds the same at some distance away from her home. After completing the homework, she is walking away from the base of a lamp-post at a speed of 1.2 m/s. The lamp is 3.6 m above the ground (see below figure).

1+1+2



- (i) Find her distance from the base of the lamp post after 4 seconds. (2 marks)
- (ii) Find the length of her shadow after 4 seconds. (2 marks)
- OR
- (ii) Find the ratio AC : CE. (2 marks)