

X – Maths

Time : 3 hours

Maximum Marks : 80

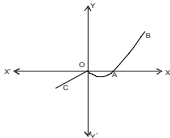
General Instruction :

- All questions are compulsory.
- The question paper consists of 30 questions divided into 4 sections- A,B,C and D. Section A comprises of ten question of 01 mark each, Section B comprises of five questions of 02 marks each, Section C comprises of 03 marks each and Section D comprises of five questions of 06 marks each.
- All questions in Section A are to be answered in one word, one sentences or as per the exact requirement of the questions.
- There is no overall choice. However, internal choice has been provided in one question of 02 marks each, three questions of 03 marks each and two questions 06 marks each. You have to attempt only one of the alternatives in all such question.
- In question on construction, drawings be neat exactly as per the given.
- Use of calculators in not permitted.

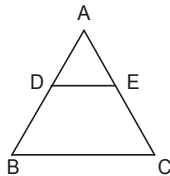
SECTION - A

Question numbers 1 to 10 carry one mark each.

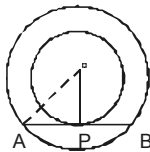
- The product of two numbers is 20736 and their H.C.F. is 54 find their L.C.M.
- The graph of $y=P(x)$ is given below for same polynomial $P(x)$ find number of zeroes of $P(x)$



- For what value of 'K' the quadratic equation $x^2 - Kx - 4 = 0$ has equal roots?
- Given that $\tan\theta = 1$, what is the value of $\frac{\operatorname{cosec}^2\theta - \sec^2\theta}{\operatorname{cosec}^2\theta + \sec^2\theta}$
- Which term of the sequence 114, 109, 104,.....is the first negative terms ?
- A cylinder, a cone and a hemi sphere stand on equal bases and have the same height. What is the ratio of their volume.
- In the adjoining fig. $AB=12\text{cm}$, $AD=8\text{cm}$, $AF=12\text{cm}$ and $AC=18\text{cm}$. find whether DE/BC



- In the given fig. O is the center of two concentric circles of radii 3 cm and 5 cm. AB is a chord of outer circle which touches inner circle then find the



length of chord AB.

- A card is drawn at random from a deck of cards. Find the probability that it is either a club or a queen.
- Find the value of a,b,c. and d in the following frequency distribution.

Class interval	Frequency	Cumulative
0-10	a	8
10-20	6	b
20-30	9	23
30-40	c	31
40-50	3	34
50-60	d	36

SECTION - B

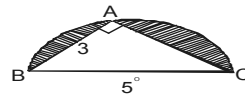
Question numbers 11 to 15 carry 2 mark each.

- Find a point on the y-axis which is equidistant from the point A (6,5) and B (-4,3)
- $3 \tan\theta = 4$, evaluate : $\frac{3 \sin\theta + 2 \cos\theta}{3 \sin\theta - 2 \cos\theta}$
or
If $\tan = 1/\sqrt{7}$, show that $\frac{\operatorname{cosec}^2\theta - \sec^2\theta}{\operatorname{cosec}^2\theta + \sec^2\theta} = 3/4$
- One card is drawn from a well shuffled deck of 52 playing cards. Find the probability of getting
(i) a non-face card
(ii) a black king or a red queen
- Find the value of m so that $m+1$, $4m-6$ and $3m-2$ are three consecutive terms of an A.P.
- In a ΔABC , AD is perpendicular to BC show that $(AB^2 + CD^2) = (AC^2 + BD^2)$

SECTION - C

Question numbers 16 to 25 carry 3 mark each.

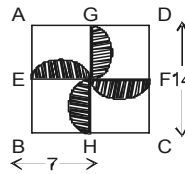
- Check whether the $3x-7$ is a factor of $6x^2+x^2-26x-25$ by using division alg- rithm.
- In reply to the adjoining fig. find the area of the shaded region.



- A point O is in the interior of a rectangle ABCD prove that $OA^2 + OC^2 = OB^2 + OD^2$
- Construct a ΔABC in which $AB=5\text{cm}$, $\angle B=60^\circ$ and altitude $CD=3\text{cm}$. construct a $\Delta AQR \sim \Delta ABC$ such that each side is 1.5 times that of the corresponding sides of ΔABC .
- The two vertices of a triangle are (6,7) each (4,-5) if the centroid of a triangle is origin, find the co-ordinate of the third vertex.
- If a $\operatorname{cosec} A = P$ and $\cot A = q$ prove $p^2/a^2 - q^2/b^2 = 1$

show that $\frac{\tan^3\theta}{1+\tan^2\theta} + \frac{\cot^3\theta}{1+\cot^2\theta} = \sec\theta \operatorname{cosec}\theta - 2\sin\theta \cos\theta$

- Find the point which is equidistant from the point (1,1) (2,3)
- Find the A.P. whose sum to first n terms is $n(5n-3)$.
- Solve for x : $\frac{x+1}{x-1} - \frac{x-1}{x+1} = 5/6$
- In the adjoining fig. Semicircular flowerbeds are made as shown by the shaded region. Find the area of the shaded region



SECTION - C

Question numbers 26 to 30 carry 6 mark each.

- A cube and cuboids have the same volume the dimensions of the cuboids are in the ratio 1:2:3. if the difference between the cost of polishing the cuboids and the cube at the rate of Rs. $5/m^2$ is Rs. 80, find their volumes.
or
A rocket is in the form of a cylinder close at the lower and with a cone of the same radius attached to the top. The cylinder is of the radius 2.5 m. and height 21m. and the cone has the slant height 8 m. Calculate the total surface area.
- A vertical tower stands on a horizontal plane and is surmounted by vertical flagstaff of height h. At a point on the plane, the angle of elevation of the bottom of the flagstaff is α and that of the top of the flagstaff is β . Prove the height of the tower is $\frac{h \tan\alpha}{\tan\beta - \tan\alpha}$
- Prove that the ratio of the areas of two similar triangles is equal to the ratio of squares of their corresponding side
Using the above prove the following "the area of the equilateral triangle described by side of a square is half the area of the equilateral triangle described on its diagonal".
- The median of the following data is 525 find the value of x and y.

Class Interval	0-100	100-200	200-300	300-400	400-500	500-600	600-700	700-800	800-900	900-1000	Total
Frequency	2	5	x	12	17	20	y	9	7	4	100

- The sum of areas of two squares is 640m^2 . If the difference in their perimeters be 64 meter. Find the sides of the two squares.
or
Place A and B are 100 km apart on a highway. One car starts from A and another B at the same time. If the car travels in the same direction at different speed they meet in 5 hours. If they travel towards each other, they meet in one hour. What is the speeds of both cars.?

TIPS

- First learn formulae, theorems, trigonometric ratios, identities with derivations. Do not leave any concept as an option.
- The only key to master the mathematics is to practice problems daily.
- Every new question should be written on a new page. Sub questions can be attempt on the same page.
- In case you have time and also some questions left that you think that you are not sure about, you must try to attempt those.
- Read the entire question paper thoroughly as soon as you receive it.



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