

Model Question Paper

Subject: Mathematics – 2018-19

Total No. of Questions: 40

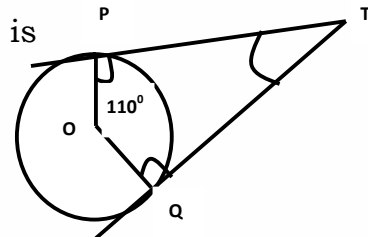
Subject Code: 81E

Time : 3 Hours

Max Marks: 80

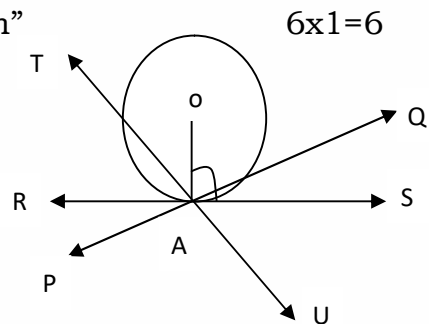
I Four alternatives are given to each question. Choose $8 \times 1 = 8$ appropriate answer. Write it along with its alphabet

- 1) The distance between two points p(x_1, y_1) and q (x_2, y_2) is given by
 - a) $\sqrt{(x_1 + x_2)^2 + (y_1 + y_2)^2}$
 - b) $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$
 - c) $\sqrt{(x_1 - x_2) - (y_1 - y_2)}$
 - d) $\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$
- 2) The degree of polynomial $p(x) = x^2 - 3x + 4x^3 - 6$ is
 - a) 2
 - b) 1
 - c) 3
 - d) 6
- 3) Which one of the following cannot be the probability of an event
 - a) $2/3$
 - b) -1.5
 - c) 15%
 - d) 0.7
- 4) The curved surface area of frustum of a cone is given by
 - a) $\pi (r_1 + r_2)l$
 - b) $\pi (r_1 + r_2)h$
 - c) $\pi (r_1 - r_2)l$
 - d) $\pi (r_1 - r_2)h$
- 5) The solutions for the equations $x + y = 10$ and $x - y = 2$ are
 - a) $x = 6$
 $y = 4$
 - b) $x = 4$
 $y = 6$
 - c) $x = 7$
 $y = 3$
 - d) $x = 8$
 $y = 2$
- 6) In the adjoining figure, TP and TQ are the tangents to the circle with center O. The measure of $\angle PTQ$ is
 - a) 90°
 - b) 110°
 - c) 70°
 - d) 40°
- 7) The coordinates of origin are
 - a) (1, 1)
 - b) (2, 2)
 - c) (0, 0)
 - d) (3, 3)



- 8) If the discriminant of quadratic equation $b^2-4ac= 0$ then the roots are
- a) Real and distinct b) Roots are equal
- c) No real roots d) Roots are unequal and irrational

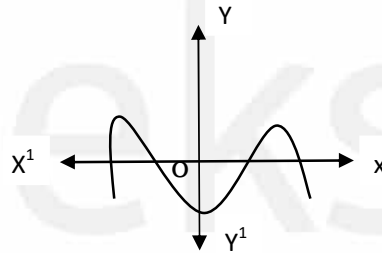
9) State “Basic proportionality theorem”



10) Identify the tangent to the circle in the adjoining figure and write its name

11) State Euclid’s division lemma

12) Find the number of zeroes of a polynomial $p(x)$ from the graph given



13) Find the distance the point $p(3,4)$ and the origin.

14) Express 140 as a product of prime factors.

15) How many two- digit numbers are divisible by 3?

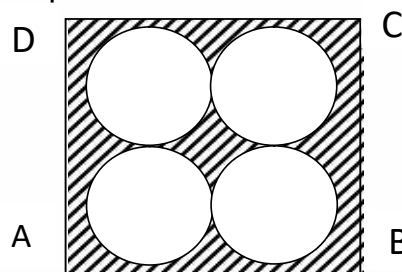
$$2 \times 16 = 32$$

16) $\Delta ABC \sim \Delta DEF$, Area of $\Delta ABC = 64\text{cm}^2$ and area of $\Delta DEF = 121\text{cm}^2$ If $EF=15.4$ cm, Find BC .

17) Solve for x and y : $2x+y =6$ and $2x-y =2$

18) Five years ago, Gouri was thrice as old as Ganesh. Ten years later Gouri will be twice as old as Ganesh. How old are Gouri and Ganesh

19) Find the area of the shaded region in the figure, where $ABCD$ is a square of side 14cm



- 20) Construct a pair of tangents to a circle of radius 5cm which are inclined to each other at an angle of 60° .
- 21) Find the value of k, if the points A (2, 3), B (4, k) and C (6, -3) are collinear.
- 22) Prove $3 + \sqrt{5}$ is irrational
- 23) Find the zeroes of polynomial $p(x) = 6x^2 - 3 - 7x$
- 24) Find the quadratic polynomial whose sum and product of zeroes are $\frac{1}{4}$ and -1 respectively
- 25) Solve the equation $3x^2 - 5x + 2 = 0$ by using the formula
- 26) Evaluate : $2\tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$
- 27) The angle of elevation of the top of a tower from a point on the ground, which is 30m away from the foot of the tower is 30° . Find the height of the tower.
- 28) As observed from the top of a 100m high light house from the sea level the angle of depression of two ships are 30° and 45° . If one of the ship is exactly behind the other on the same side of the light house, find the distance between the two ships ($\sqrt{3} \approx 1.73$)
- 29) A die is thrown once. Find the probability of getting a number lying between 2 and 6.
- 30) The volume of a cube is 64cm^3 . Find the total surface area of the cube.
- 31) Prove that "The tangent at any point of a circle is perpendicular to the radius through the point of contact". 3x6=18
- OR
- Prove that "The lengths of tangents drawn from an external point to a circle are equal"
- 32) Construct a triangle of sides 4cm, 5cm and 6cm and then a triangle similar to it, whose sides are $\frac{2}{3}$ of the corresponding sides of the first triangle.

- 33) A two digit number is four times the sum of the digits. It is also equal to 3 times the product of digits. Find the number

OR

The numerator of a fraction is 3 less than its denominator. If 2 is added to both the numerator and the denominator, then the sum of the new fraction and original fraction is $\frac{29}{30}$. Find the original fraction.

- 34) If $4 \tan \theta = 3$ Evaluate $\left[\frac{4 \sin \theta - \cos \theta + 1}{4 \sin \theta + \cos \theta - 1} \right]$

OR

If $\tan 2A = \cot (A - 18^\circ)$ where $2A$ is an acute angle. Find the value of A

- 35) Calculate the median for the following data

Class interval	Frequency (F)
0-20	6
20-40	8
40-60	10
60-80	12
80-100	6
100-120	5
120-140	3

$n=50$

OR

Calculate the mode for the following frequency distribution table

Class interval	Frequency (F)
5-15	6
15-25	11
25-35	21
35-45	23
45-55	14
55-65	5

$n=80$

- 36) Construct 'ogive' for the following distribution

C.I	0-3	3-6	6-9	9-12	12-15
F	9	3	5	3	1

- 37) The sum of four consecutive terms which are in an arithmetic progression is 32 and the ratio of the product of the first and the last term to the product of two middle terms is 7:15. Find the number.

OR

In an arithmetic progression of 50 terms, the sum of first ten terms is 210 and the sum of last fifteen terms is 2565. Find the arithmetic progression.

- 38) Prove that “In a right angled triangle the square on hypotenuse is equal to the sum of the square on the other two sides”.
- 39) Solve the equations graphically

$$2x - y = 2$$

$$4x - y = 4$$

- 40) A wooden article was made by scooping out a hemisphere from one end of a cylinder and a cone from other end as shown in the figure. If the height of cylinder is 40cm, radius is 7cm and height of cone is 24cm, find the volume of wooden article.

