PRAGATHI...THE SCHOOL

Dakshina Bharatha Mahila Samaja Premises,
Whitefield Railway Station Road, Kadugodi, Bangalore - 560067

Date : 26/11/2022	***Periodic Test - 1***	***Time allowed : 3Hrs***
MATHEMATICS(Standard) - 041		***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 of* ***1****,* ***1*** *and* ***2*** *marks each respectively.*
7. *All Questions are compulsory. However, an internal choice in* ***2*** *Qs of* ***5*** *marks,* ***2*** *Qs of* ***3*** *marks and* ***2*** *Questions of* ***2*** *marks has been provided. An internal choice has been provided in the* ***2*** *marks questions of Section E*
8. *Draw neat figures wherever required. Take* ***π =22/7*** *wherever required if not stated.*

Section A consists of 20 questions of 1 mark each*.*

1. *Let a and b be two positive integers such that* $a = p^3q^4$ & $b = p^2q^3$, *where p and q are prime numbers. If HCF(a,b) =* p^mq^n *and LCM(a,b) =* p^rq^s, *then (m+n)(r+s)=*

(a) 15 *(b) 30* *(c) 35* *(d) 72*

2. *The number* $\left(\sqrt{3}+\sqrt{5}\right)^2$ *is*

a) an irrational number *b) an integer*
c) a rational number *d) not a real number*

3. *Let p be a prime number. The quadratic equation having its roots as factors of p is*

(a) $x^2-px+p=0$ *(b)* $x^2-(p+1)x+p=0$ *(c)* $x^2+(p+1)x+p=0$ *(d)* $x^2-px+p+1=0$

4. *If the sum and product of the roots of the equation* $kx^2+6x+4k=0$ *are equal, then k =*

(a) 3/2 *(b) -2/3* *(c) -3/2* *(d) 2/3*

5. *The HCF of two consecutive even numbers is*

a) 2 *b) 1* *c) 0* *d) 3*

6. *The distance between the points (3, -2) and (-3, 2) is:*

a) 40 *b)* $4\sqrt{10}$ *c)* $2\sqrt{10}$ *d)*$\sqrt{52}$

7. *If the vertices of a parallelogram PQRS taken in order are P(3,4), Q(-2,3) and R(-3,-2), then the coordinates of its fourth vertex S are*

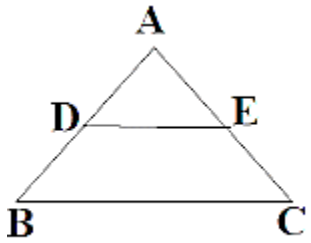
(a) (-2,-1) *(b) (-2,-3)* *(c) (2,-1)* *(d) (1,2)*

8. *ABCD is a trapezium with AD // BC and AD = 4cm. If the diagonals AC and BD intersect each other at O such that AO/OC = DO/OB =1/2, then BC =*

a) 6cm *b) 7cm* *c)8cm* *d) 9cm*

9. *In the given figure DE II BC , AE= a units, EC = b units DE = x units BC = y units, which of the following is true?*

(a) $x = \frac{a+b}{ay}$ *(b)* $y = \frac{ax}{a+b}$ *(c)* $x = \frac{ay}{a+b}$ *(d* $\frac{x}{y} = \frac{a}{b}$



10. *If two tangents inclined at an angle of 60^o are drawn to a circle of radius 3cm, then the length of each tangent is equal to*

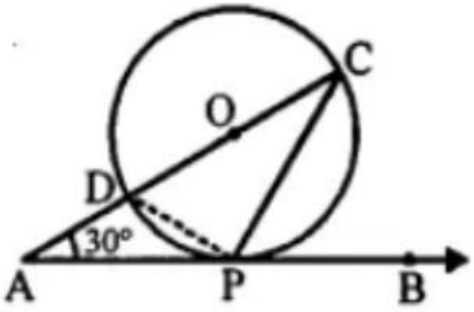
a) $3\sqrt{3}cm$ *b) 3cm* *c)6cm* *d)* $\frac{\sqrt{3}}{3}cm$

11. *The area of a circle that can be inscribed in a square of 6cm is*

a) $36\pi cm^2$ *b)* $18\pi cm^2$ *c)* $12\pi cm^2$ *d)* $9\pi cm^2$

12. *In the given figure, O is the centre of the circle. AB is the tangent to the circle at the point P If* $\angle PAO = 30°$ *then* $\angle CPB + \angle ACP$ *is equal to*

a) 120° *b) 90°* *c) 150°* *d) 60°*



13. *One ticket is drawn at random from a bag containing tickets numbered 1 to 40. The probability that the selected ticket has a number, which is a multiple of 7, is*

a) 1/5 *b) 1/8* *c) 1/7* *d) 7/40*

14. *The difference of mode and median of a data is 24, then the difference of median and mean of the data is*

a) 8 *b) 12* *c) 24* *d) 36*

15. *The mean of 20 numbers is zero. Of them, at the most, how many may be greater than zero?*

a) 1 *b) 0* *c) 10* *d) 19*

16. *A bag contains 3 red balls, 5 white balls and 7 black balls. What is the probability that a ball drawn from the bag at random will be neither red nor black?*

a) 1/3 *b) 8/15* *c) 7/15* *d) 1/5*

17. *Two dice are thrown simultaneously. The probability that the sum of the numbers appearing on the dice is 1 is*

a) 3 *b) 0* *c) 2* *d) 1*

18. *In a lottery , there are 8 prizes and 16 blanks. What is the probability of getting a prize?*
a) 1/2 b) 1/3 c) 2/3 d) None of these

19. ***Assertion (A):****L.C.M. and H.C.F . of a and 20 are 100 and 10 respectively , then a = 50.*
Reason (R):*L.C.M H.C.F . = First number X Second number*
a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false. d) A is false but R is true.

20. ***Assertion (A):*** *In a circle of radius 6 cm, the angle of a sector is 60°. Then the area of the sector is 132/7 cm^2*
Reason (R): *Area of the circle with radius r is πr^2.*
a) Both A and R are true and R is the correct explanation of A.
b) Both A and R are true but R is not the correct explanation of A.
c) A is true but R is false. d) A is false but R is true.

Section B consists of 5 questions of 2 marks each.

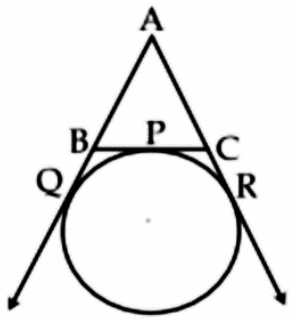
21. *Find the zeroes of the quadratic polynomial $2x^2 - 25$.*

22. *If the point A(0, 2) is equidistant from the points B(3, p) and C(p, 5), find p. Also find the length of AB..*

OR

In what ratio does the point P(2, -5) divide the line segment joining A(-3, 5) and B(4, -9)?

23. *In fig. circle touches the side BC of a triangle ABC at the point P and AB and AC produced at Q and R. Show that AQ = 1/2 (perimeter ΔABC)*



OR

Prove that tangents drawn at the ends of a chord make equal angles with the chord

24. *A chord of circle of radius 10cm subtends a right angle at the centre. Find the area of the minor segment.*

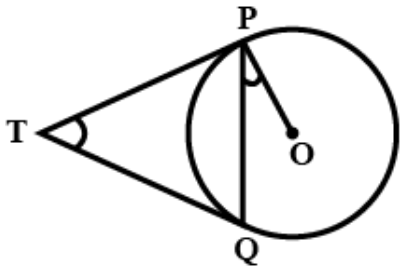
25. *The probability of selecting a blue marble at random from a jar that contains only blue, black and green marbles is 1/5. The probability of selecting a black marble at random from the same jar is 1/4. If the jar contains 11 green marbles, find the total number of marbles in the jar.*

Section C consists of 6 questions of 3 marks each.

26. *Prove that $\sqrt{3}$ is an irrational number.*

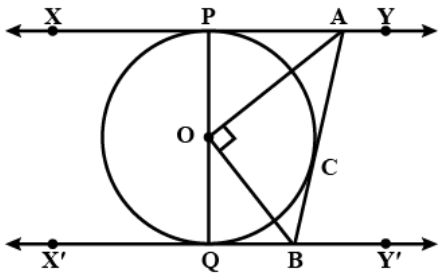
27. *Find the zeroes of the following quadratic polynomials $6x^2 - 3 - 7x$ and verify the relationship between the zeros and the coefficients.*

28. *Two tangent TP and TQ are drawn to a circle with centre O from an external point T. Prove that ∠PTQ=2 ∠OPQ*

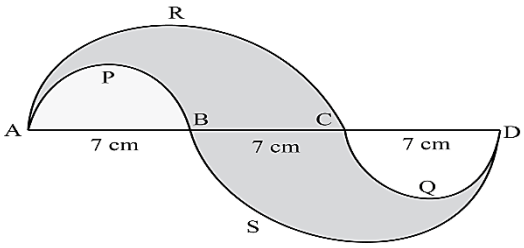


OR

In the figure XY and X'Y' are two parallel tangents to a circle with centre O and and another tangent AB with point of contact C interesting XY at A and X'Y' at B prove that ∠AOB=90^0

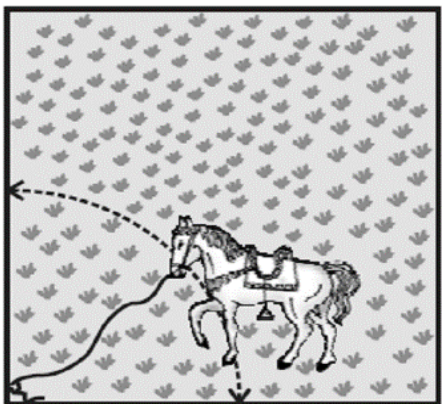


29. *In the given fig, APB and CQD are semi circles of diameter 7 cm each, while ARC and BSD are semicircles of diameter 14 cm each. Find the perimeter & Area of the shaded region. (Use π = 22/ 7)*

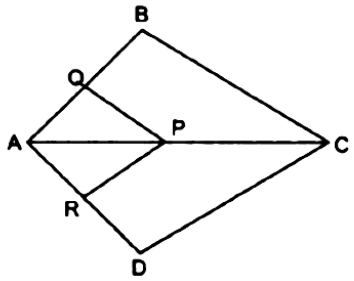


OR

A horse is tied to a peg at one corner of a square shaped grass field of side 15 m by means of a 5 m long rope . Find (i) the area of that part of the field in which the horse can graze. (ii) the increase in the grazing area if the rope were 10 m long instead of 5 m.



30. *If $PQ \| BC$ & $PR \| CD$. Prove that* $(i)\dfrac{AR}{AD} = \dfrac{AQ}{AB}$ $(ii)\dfrac{QB}{AQ} = \dfrac{DR}{AR}$

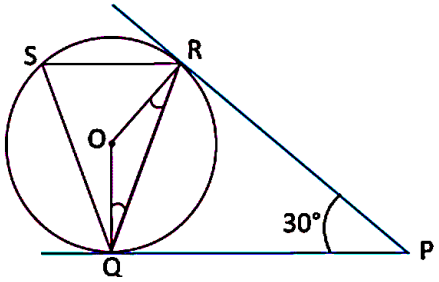


31. *Cards marked with the number 2 to 101 are placed in a box and mixed thoroughly. One card is drawn from the box. Find the probability that the number on the card is:*
(i) A number is perfect square
(ii) A prime number less than 20
(iii) A composite number less than 30

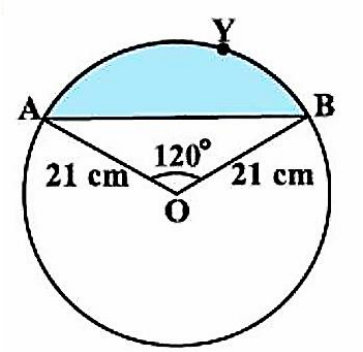
Section D consists of 4 questions of 5 marks each.

32. *Prove that if a line is drawn parallel to one side of a triangle intersecting the other two sides in distinct points, then the other two sides are divided in the same ratio.*
Using the above theorem prove that a line through the point of intersection of the diagonals and parallel to the base of the trapezium divides the non parallel sides in the same ratio.

33. *In the given figure , Find ∠ROQ , ∠RQP, ∠RSQ & ∠ORP. If PQ=40m and OQ=30m then PO=*



34. *Find the area of the segment AYB shown in Fig. , if radius of the circle is 21 cm and ∠ AOB = 120°. (Use π = 22/7)*



OR

Prove that opposite sides of a quadrilateral circumscribing a circle subtend supplementary angles at the centre of the circle

35. *If the median of the distribution given below is 28.5, find the values of x and y.*

Class	*0-10*	*10-20*	*20-30*	*30-40*	*40-50*	*50-60*	*Total*
Frequency	*5*	*x*	*20*	*15*	*y*	*5*	*60*

OR

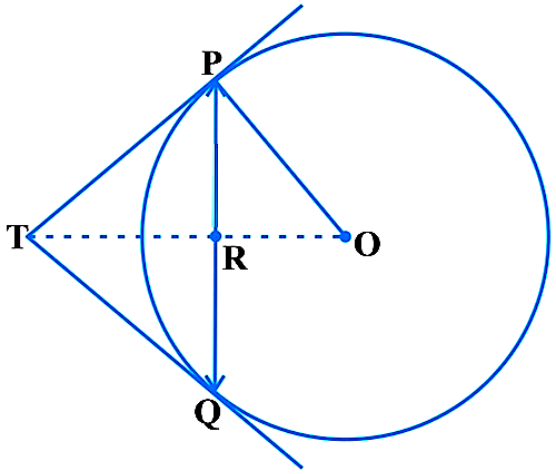
The median of the following data is 525. Find the values of x and y, if the total frequency is 100

Class interval	*Frequency*
0–100	*2*
100–200	*5*
200–300	*x*
300–400	*12*
400–500	*17*
500–600	*20*
600–700	*y*
700–800	*9*
800–900	*7*
900–1000	*4*

Section E Case study-based questions are compulsory.
Consists of 3 questions of 4 marks each.

36. ***Case Study – 1***

PQ is a chord of length 24 cm of a circle of radius 13 cm. The tangents at P and Q intersect at a point T.



1) *Find OR*
2) *Find TR*
3) *Find TP*

OR

Find QT

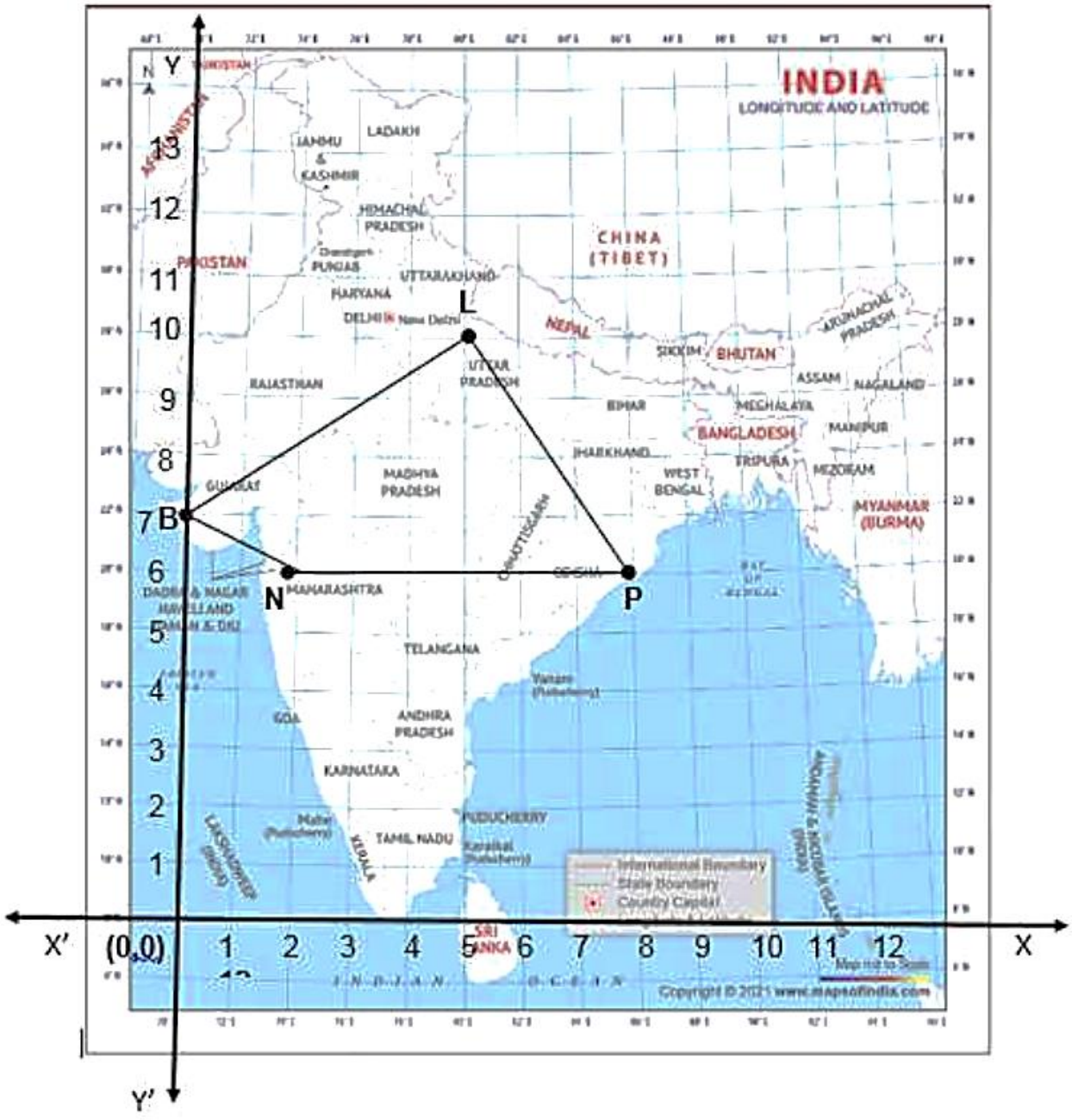
37. ***Case Study – 2:***

In a GPS, The lines that run east-west are known as lines of latitude, and the lines running north-south are known as lines of longitude. The latitude and the longitude of a place are its coordinates and the distance formula is used to find the distance between two places.The distance between two parallel lines is approximately 150 km. A family from Uttar Pradesh planned a round trip from Lucknow (L) to Puri (P) via Bhuj (B) and Nashik (N) as shown in the given figure below.

1) *Find the distance between Lucknow (L) to Bhuj(B).*
2) *If Kota (K), internally divide the line segment joining Lucknow (L) to Bhuj (B) into 3 : 2 then find the coordinate of Kota (K).*
3) *Name the type of triangle formed by the places Lucknow (L), Nashik (N) and Puri (P)*

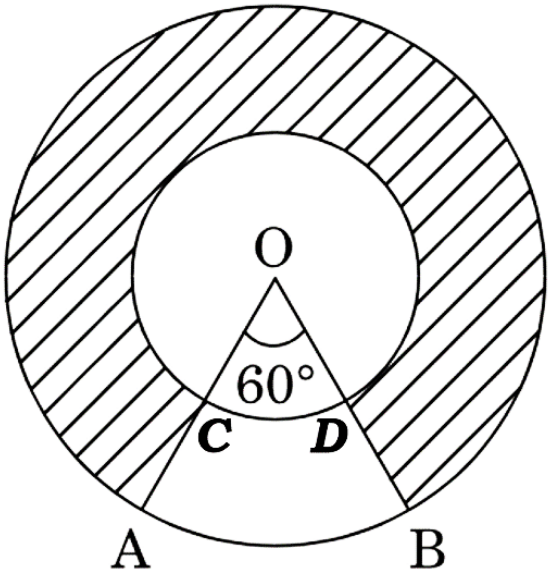
[OR]

Find a place (point) on the longitude (y-axis) which is equidistant from the points Lucknow (L) and Puri (P).



38. ***Case Study – 3:***

Two concentric circles with centre O, have radii 21 cm and 42 cm. If $\angle AOB = 60^0$



1) *Find Major Sector Area of OAB*
2) *Find Minor Sector Area of OCD*
3) *Find the shaded region*

OR

Find the Area between ABCD