

**DDPI Office**  
**School Education Department**  
**Bangalore South District**  
**Kalasipalya-Bangalore-02**

**SSLC Model Question Paper**

**Subject : MATHEMATICS**

English Medium.

Time : 10-30 A.M. to 1-45 P.M.

Max. Marks : 80

**General Instructions to the Candidate :**

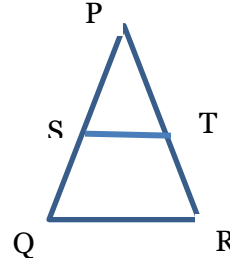
1. This question paper consists of objective and subjective types of 38 questions.
2. At the time of commencement of the examination. Check whether all the pages of the question paper are intact.
3. Follow the instructions given against both the objective and subjective types of questions.
4. Figures in the right hand margin indicate maximum marks for the questions.
5. The maximum time to answer the paper is given at the top of the question paper. It includes 15 minutes for reading the question paper.

**I Four alternatives are given for each of the following questions/incomplete statements. Choose the correct alternative and write the complete answer along with its letter. 8\*1=8**

1 If 'A' and 'B' are any two positive integers, 'H' and 'L' are HCF & LCM of these integers respectively, then the correct relationship in the following is

- A)  $H \times L = L \times B$       B)  $H \times L = A \times B$       C)  $H + L = A + B$       D)  $H = A - B$

2 In the given figure  $ST \parallel QR$  then  $\frac{PS}{SQ}$  is equal to



- A)  $\frac{PT}{TR}$       B)  $\frac{PS}{TR}$       C)  $\frac{PT}{SQ}$       D)  $\frac{PT}{SR}$

3 The distance between origin and a point  $(x, y)$  is

- A)  $x^2 + y^2$       B)  $\sqrt{x^2 - y^2}$       C)  $x^2 - y^2$       D)  $\sqrt{x^2 + y^2}$

4 The probability of a sure event is

- A) 1      B) 0      C) -1      D) 1.5

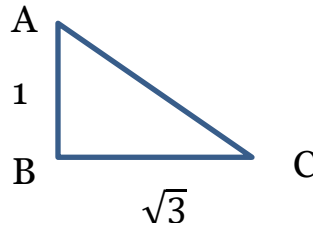
5 The curved surface area of a cylinder of radius 'r' and height 'h' is

- A)  $2\pi r(r + h)$       B)  $\pi r^2 h$       C)  $\frac{\pi x^2 h}{3}$       D)  $2\pi r h$

6 Length of an arc of a sector of a circle of radius 'r' and angle ' $\theta$ ' is

- A)  $\frac{\theta}{360^\circ} \times \pi r^2$       B)  $\frac{\theta}{360} \times 2\pi x^2$       C)  $\frac{\theta}{180} \times 2\pi x$       D)  $\frac{\theta}{360} \times 2\pi r$

7 In the figure, the value of  $\sin$



- A)  $\frac{5}{3}$       B)  $\frac{3}{5}$       C)  $\frac{3}{4}$       D)  $\frac{5}{4}$

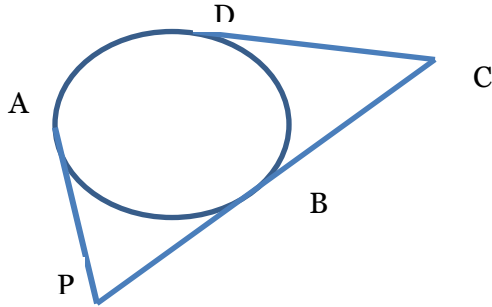
8 26 English alphabet cards are put in a box and shaken well. If a card is chosen at random, then the probability that the card is with an Vowel is

- A)  $\frac{3}{26}$       B)  $\frac{5}{26}$       C)  $\frac{1}{26}$       D)  $\frac{21}{26}$

**II Answer the following Questions**

**8 × 1 = 8**

- 9) Define arithmetic progression.
- 10) If a pair of linear equations in two variables are inconsistent, then how many solutions do they have?
- 11) Write the degree of the polynomial  $p(x) = 7x^3 - 4x + 2$
- 12) Write the condition for the equation  $ax^2 + bx + c = 0$  to have equal roots.
- 13) State the converse of Basic proportionality Theorem
- 14) Define Sector of a circle.
- 15) In the figure  $AP = 3$  cm,  $PC = 8$  cm Find the length of  $CD$



- 16) Find the median of the given data 5,3,14,16, & 119

**III Answer the following**

**8 × 2 = 16**

- 17) Find the HCF and LCM of 3,8 and 15
- 18) Prove that  $6 - \sqrt{5}$  is irrational
- 19) Find the number of terms in the AP 12,15,18, ... 99
- 20) Solve  $2x + y = 11$  and  $3x - y = 14$
- 21) The product of two consecutive positive integer is 306 . Find the integers.

OR

The length of a rectangular field is thrice its breadth. The area of the field is 147 square metres, then find its length and breadth..

- 22) Find the coordinates of the point which divides the line joining (0,6) and (4,3) in the ratio 1: 2

23 )If  $\sin A = \frac{3}{4}$  find the value of  $\cos A$ ,  $\tan A$

OR

Find the value of  $\frac{\sin 30^\circ + \cos 60^\circ}{\operatorname{cosec} 30^\circ - \cot 45^\circ}$

- 24) A die is thrown twice. What is the Probability of getting the sum of numbers on its faces is 10

**IV Answer the following questions**

**9 × 3 = 27**

- 25) Find the sum of first 20 positive integers divisible by 5
- 26) Find the sum of  $5 + 8 + 11 + \dots + 50$  using formula

OR

The 2<sup>nd</sup> and 3<sup>rd</sup> term of an AP are 14 and 18 respectively. Find the sum of first 26 terms of the AP using the formula.

27) Find the zeroes of the polynomial  $P(x) = x^2 - 2x - 8$  and verify the relationship between the zeroes and coefficients.

(OR)

Find the quadratic polynomial whose sum of the zeroes is 7 and product of the zeroes is 12. Also find the zeroes of the polynomial

28) A vertical pole of length 6 m casts a shadow 4 m long on the ground and at the same time a tower casts a shadow 28 m long. Find the height of the tower.

29) Prove that "the lengths of tangents drawn from an external point to a circle are equal".

30) Find the coordinates of the point ' ' on the x axis which is equidistant from A(5,9) and (-4,6).

31) Prove that  $\frac{\sin A}{1+\cos A} + \frac{1+\cos A}{\sin A} = 2\operatorname{cosec} A$

(OR)

prove that  $\frac{\cos A}{1-\tan A} + \frac{\sin A}{1-\cot A} = \cos A + \sin A$ .

32) Calculate the mean of the frequency distribution table given below.

Class interval	0 – 20	20 – 40	40 – 60	60 – 80	80 – 100
frequency	15	10	35	50	40

(OR)

Calculate the median of the frequency distribution table given below

Class interval	0 – 10	10 – 20	20 – 30	30 – 40	40 – 50
frequency	7	9	15	11	8

33) A circular pond is 17.5 m in diameter. It is surrounded by a 2 m wide walking path. Find the cost of constructing path at the rate of Rs 25 per square meter

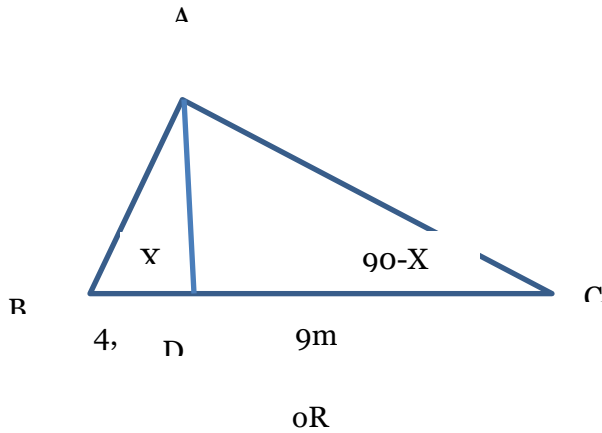
**V Answer the following**

**4 × 4 = 16**

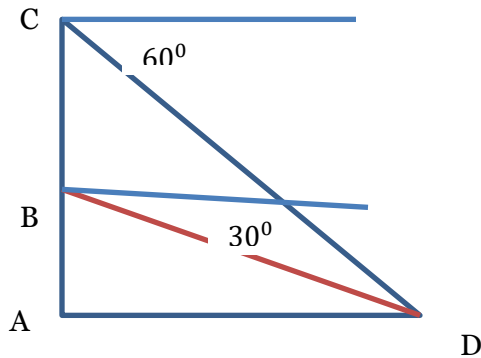
34) Solve graphically  $2x + y = 8$  and  $x - y = 1$

3.5) Find the roots of the equation  $\frac{1}{x+4} - \frac{1}{x-7} = \frac{11}{30}$  ( $x \neq -4$  &  $x \neq 7$ )

- 36 Prove that "If in the triangles, corresponding angles are equal, then their corresponding sides are in the same ratio and hence, the two triangles are similar"
- 37 The angles of elevation of the top of a tower from two points at a distance of 4 m and 9m from the base of the tower and in the same straight line with it are complementary Find the height of the tower



The angle of depression from the top of a vertical tower to a point on the ground is found to be  $60^\circ$  and from a point 50 m above the foot of the tower, the angle of depression to the same point found to be  $30^\circ$  as shown in the figure. Find the height of the tower.



**VI Answer the following**

**1 × 5 = 5**

38) A toy is in the form of a cone mounted on a hemisphere with the same radius. If the diameter of the conical portion is 6 cm and its height is 4 cm , then find the surface area of the toy.

**Bangalore South District Level SSLC - Model Question Paper – 2024-25**

**Subject:- Mathematics-81E**

**Duration : 3 hrs 15minutes**

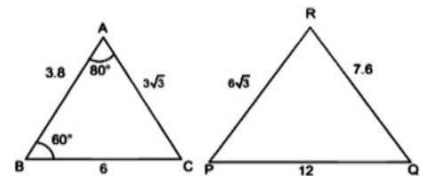
**Maximum marks : 80**

**I. Four alternatives are given for each of the following questions/incomplete statements. Choose the correct alternative and write the complete answer along with its letter of alphabet. (8x1=8)**

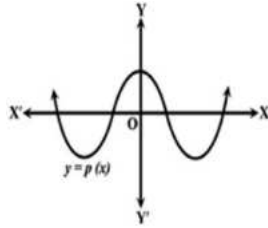
- The HCF of 72 and 120 is 24. Then their LCM is  
a) 36                      b) 720                      c) 360                      d) 72
- If  $a, b, c, d, e$  and  $f$  are in A.P. then  $e-c$  is equal to . . . . .  
a)  $2(c - a)$               b)  $2(f - d)$               c)  $2(d - c)$               d)  $d - c$
- The solution of the equations  $x - y = 2$  and  $x + y = 4$  is  
a) 1 and -3              b) -1 and 3              c) 3 and 1              d) -1 and -3
- Zeroes of the quadratic polynomial  $x^2 - 3x$  are  
a) -3 and 0              b) -1 and 3              c) 3 and 0              d) 1 and 3
- The value of variable  $b = 5$  satisfies the equation  
a)  $(b - 3)(b + 5) = 0$     b)  $(b + 3)(b + 5) = 0$   
c)  $(b - 3)(b - 5) = 0$     d)  $(b - 3)(b + 6) = 0$
- Triangle with sides 2cm, 3cm, 4cm is similar to the triangle of following measures  
a) 4cm, 5cm, 6cm    b) 5cm, 6cm, 7cm  
c) 12cm, 13cm, 14cm    d) 6cm, 9cm, 12cm
- The probability of a certain event is  
a) 1    b) 0    c) 0.5    d) 0.75
- Given  $\tan A = \frac{3}{4}$  then the value of  $\sin A$  is  
a)  $\frac{4}{5}$     b)  $\frac{3}{5}$     c)  $\frac{5}{4}$     d)  $\frac{5}{3}$

**II. Answer the following questions: (8x1=8)**

- Find the value of 'c' for which the pair of equations  $cx - y = 2$  and  $6x - 2y = 3$  will have infinitely many solutions.
- Find the distance of the point  $P(4, -3)$  from the origin .
- "The product of two consecutive positive integers is 72" Write the algebraic equation of this statement
- If  $\sin A = \cos A$ , then find the value of A.
- In the given figure, find  $\angle P$ .



14. Find the number of zeroes of the polynomial of the given curve shown in the graph.



15. If the volume of a cylinder is  $30\text{cm}^3$  then what is the volume of a cone having same radius and same height?
16. The mean of 10 numbers is 15 and that of another 20 number is 24 then find the mean of all 30 observations.

**III. Answer the following questions:**

**(8x2=16)**

17. Prove that  $2 + \sqrt{3}$  is an irrational number.
18. Solve the equations using elimination method:  $2x + y = 12$  and  $x + 2y = 9$
19. Find the value of 'k' if the quadratic equation  $x^2 - kx + 4 = 0$  has equal roots.

**OR**

The sum of the squares of two consecutive positive integers is 13. Find the numbers.

20. Find the distance between the points A(3,2) and B(6,2) using distance formula.

**OR**

Find the coordinates of the midpoint of the line joining the points P(3,4) and Q(5,6)

21. Find the 20<sup>th</sup> term of the AP -2, 1, 4, 7, -----
22. Find the smallest 4-digit number which is divisible by 18, 24 and 32.

**OR**

Given that  $\text{HCF}(306, 657) = 9$ , find the  $\text{LCM}(306, 657)$ .

23. XP and XQ are tangents from X to the circle with O, R is a point on the circle and a tangent through R intersect XP and XQ at A and B respectively.

Prove that  $XA + AR = XB + BR$ .

24. A heap of rice is in the form of a cone of diameter 9 m and height 3.5 m. Find the volume of the rice.

**OR**

The radius of a sphere is 10cm. If its radius is increased by 1cm then how much volume of the sphere is increased?

**IV. Answer the following questions:**

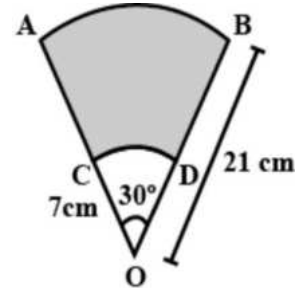
**(9x3=27)**

25. Find zeroes of the polynomial  $x^2 + 7x + 10$  and verify the relationship between zeroes and co-efficients.

26. The length of the minute hand of a clock is 14cm. Find the area swept by minute hand in 5 minutes.

**OR**

AB and CD are respectively arcs of two concentric circles of radii 21cm and 7cm and centre 'O'. If  $\angle AOB = 30^\circ$ , find the area of the shaded region.



27. Find the ratio in which the line segment joining the points (-3,10) and (6, -8) is divided by the point (-1,6).

**OR**

If the distance of P(x, y) from A(5, 1) and B(-1, 5) are equal. Prove that  $3x = 2y$ .

28. Find the mode of the frequency distribution table given below:

<b>C.I</b>	0 - 5	5 - 10	10 - 15	15 - 20	20 - 25
<b>F</b>	8	9	5	3	1

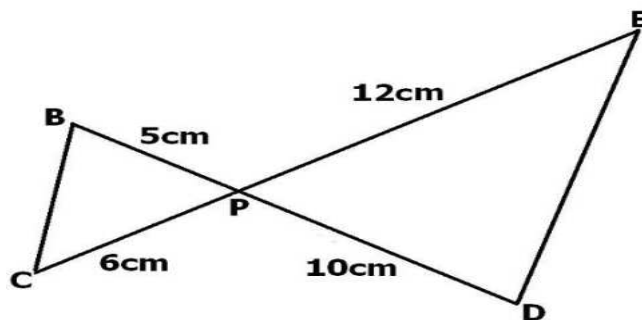
**OR**

Find the median of the frequency distribution table given below:

<b>C.I</b>	0 - 20	20 - 40	40 - 60	60 - 80	80 - 100
<b>F</b>	6	9	10	8	7

29. Prove that the lengths of tangents drawn from an external point to a circle are equal.

30. In the below Figure, BD and CE intersect each other at the point P. Is  $\Delta PBC \sim \Delta PDE$ ? Why?



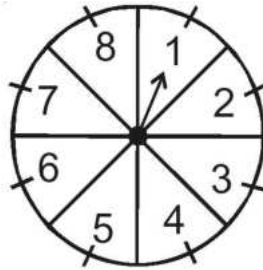
31. Prove that  $\frac{\tan^2\theta}{\tan^2\theta - 1} + \frac{\text{Cosec}^2\theta}{\text{Sec}^2\theta - \text{Cosec}^2\theta} = \frac{1}{\text{Sin}^2\theta - \text{Cos}^2\theta}$



**OR**

Prove that  $(\sin A + \operatorname{cosec} A)^2 + (\cos A + \sec A)^2 = 7 + \tan^2 A + \cot^2 A$

32. A game of chance consists of spinning an arrow which comes to rest pointing at one of the numbers 1, 2, 3, 4, 5, 6, 7, 8 (see Fig.), and these are equally likely outcomes. What is the probability that it will point at (i) 8 ? (ii) an odd number? (iii) a number greater than 2?



33. If a train travels 15 km/hr faster, it would take one hour less to travel 180 km, find the original speed of the train.

**V. Answer the following questions:**

**(4x4=16)**

34. Solve graphically :  $2x + y = 8$  and  $x + y = 5$
35. The sum of the first three terms of an A.P is 33. If the product of the first term and third term exceeds the 2nd term by 29 then find the A.P.
36. The angle of elevation of the top of a hill from the foot of a tower is  $60^\circ$  and the angle of elevation of the top of the tower from the foot of the hill is  $30^\circ$ . If the tower is 50m high. Find the height of the hill.

**OR**

The angles of elevation of the top of a tower from two points at a distance of 4 m and 9 m from the base of the tower and in the same straight line with it are complementary. Find the height of the tower.

37. A medicine capsule is in the shape of a cylinder with hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5 mm. Find its surface area.

**VI Answer the following question:**

**(1x5=5)**

38. State and prove Basic proportionality theorem.

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**DEPARTMENT OF SCHOOL EDUCATION**  
**DISTRICT LEVEL MODEL QUESTION PAPER-2024-25**

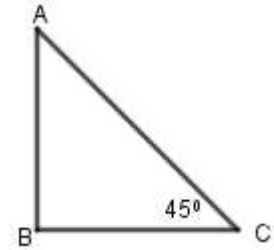
**TIME: 3.15 hrs**

**SUBJECT: MATHEMATICS**

**Max marks:80**

I. Choose the correct alternate, and write its correct answer along with the options. 8x1=8

1.  $72=2^m \times 3$  then the value of m is  
A) 1 B) 2 C) 3 D) 4
2. Number of zeroes of the given polynomial  
A) 3 B) 2 C) 1 D) 0
3. The standard form of a Quadratic equation is  
A)  $ax^2+bc+c$  B)  $ax+b=0$  C)  $ax^2+bx+c=0$  D)  $ax+b$
4. Distance of (3,5) from the x-axis is  
A) 3 B) 8 C) 15 D) 5
5. In the adjoining figure the value of BC is  
A) 50mts B) 45mts C) 1mts D) 100mts
6. Number of solutions for intersecting lines  
A) zero B) One C) two D) infinity
7. The line that intersect the circle at any two points is called as  
A) Radius B) Chord C) Tangent D) secant
8. The relation between Mean, Median, and Mode is given by  
A)  $3\text{mean}-2\text{median}$  B)  $3\text{mean}+2\text{median}$  C)  $3\text{median}-2\text{mean}$  D)  $3\text{median}+2\text{mean}$



II. Answer the following questions 8x1=8

9. State the Fundamental Theorem of Arithmetic.
10. If the value of the discriminant of a quadratic equation is positive, then what will its roots be?
11. If  $a_n=5n-2$  then find the 4<sup>th</sup> term of the Arithmetic progression.
12. In the given figure  $DE \parallel BC$  and  $AD=4\text{cm}$ ,  $DB=1.5\text{cm}$ ,  $AE=8\text{cm}$ , then find EC?
13. If  $\sin\theta = \frac{\sqrt{3}}{2}$  is an acute angle then find the value of  $\theta$ .
14. Write the formula used to find the length of an arc of a sector of radius 'r'.
15. What is the probability of obtaining all the possibilities?
16. Write the formula to find the volume of a cone.

III. Answer the following questions 8x2=16

17.  $x+y=5$ ,  $2x-3y=5$  Solve the Linear pair of quadratic equations by elimination method.
18. Find the discriminants of the quadratic equation  $x^2-5x-6=0$ .

OR

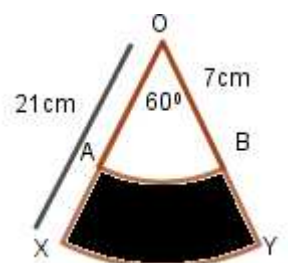
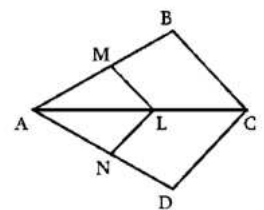
If the nature of roots of the quadratic equation  $x^2+7x+k=0$  are equal then find the value of K.

19. 4, 7, 10 . . . are in arithmetic Progression find the 20<sup>th</sup> term.

OR

Find the sum of 3-digit numbers that are divisible by 4.

20. In the given figure if  $LM \parallel CB$  and  $LN \parallel CD$ , Prove that  $\frac{AM}{AB} = \frac{AN}{AD}$
21. Find whether the vertices (5, -2) (6,4) and (7, -2) form an isosceles triangle.
22. Simplify  $\sin 30^\circ \cos 60^\circ + \cos 30^\circ \sin 60^\circ$ .
23. In the given figure if  $OA=7\text{cm}$   $OY=21\text{cm}$   $\angle AOB=60^\circ$  find the area of the shaded portion.



24. A box contains 90 cards numbered from 1 to 90. If a card is taken at random. Find the probability of getting (i) A perfect square number and (ii) A three-digit number.

IV. Answer the following Questions

3x9=27

25. Prove that  $\sqrt{2}$  is irrational.
26. Find the zeroes of the polynomial  $6x^2 - 3 - 7x$  and verify the relation between their zeroes and the co-ordinates.
27. Find two consecutive positive integers, the sum of whose squares is 365.
28. A girl of height 90cm is walking off the base of a lamp post at a speed of 12mts/sec. What is the length of her shadow after 4 seconds if the lamp is 3.6m above the ground?
29. Find the coordinates of the point which bisects the line joining the points (-1,7) and (4, -3) in the ratio 2:3.

OR

- Find the ratio in which the point (-1,6) divides the line joining (-3,10) and (6,-8).
30. Find the value of  $5\cos^2 60^\circ + 4\sec^2 30^\circ - \tan^2 45^\circ$

$$\sin^2 30^\circ + \cos^2 30^\circ$$

OR

Prove that  $\frac{\cos A}{1 + \sin A} + \frac{1 + \sin A}{\cos A} = 2 \sec A$

31. Prove that the tangent drawn to a circle at any point, and the radius drawn at the point of contact are perpendicular to each other.

OR

- Prove that the lengths of the tangents drawn to a circle from an external point are equal.
32. A chord of a circle of radius 15cm forms an angle of  $60^\circ$  at the centre find the area of major and minor segment
33. Find the mean of the following data by direct method.

Class-interval	Frequency
5-15	1
15-25	3
25-35	5
35-45	4
45-55	2

OR

The weight of 30 students is given in the below frequency distribution table, Calculate the median height of the class.

Weight (in kgs)	40-	45-	50-55	55-	60-	65-70	70-75
	45	50		60	65		
No of students	2	3	8	6	6	3	2

V. Answer the following questions

4x4=16

34. Solve the pair of linear equations graphically  $2x + y = 6$  and  $2x - y = 2$ .
35. State and prove "Thales Theorem".
36. Prove that:  $\sqrt{\frac{1 + \sin A}{1 - \sin A}} + \sqrt{\frac{1 - \sin A}{1 + \sin A}} = 2 \sec A$
37. The sum of the 4<sup>th</sup> and 8<sup>th</sup> terms of an arithmetic progression is 24 and the sum of the 6<sup>th</sup> and 10<sup>th</sup> terms is 44. Find the first three terms of the arithmetic progression.

OR

An Arithmetic Progression consists of 37 terms. The sum of the three middlemost terms is 225 and the sum of the last three terms is 429. Find the arithmetic Progression

VI. Answer the following

5x1=5

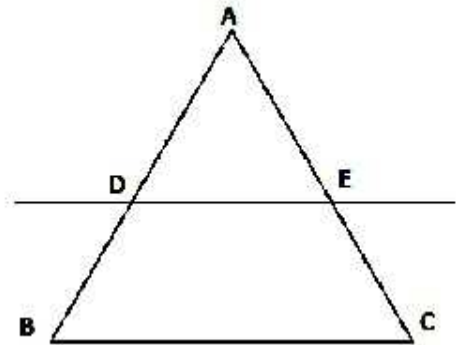
38. The volume of a cylinder is equal to 5 times the volume of a cone. The cone's base radius and slant height are 7cm and 25cm respectively. If the radius of the circular base of the cylinder is 14cm, then find the cylinder's volume and curved surface area.

**DDPI OFFICE**  
**Department of School Education**  
**Bangalore South District. Kalasipalya,**  
**Bangalore - 02**  
**Model Question Paper**  
**Subject: Mathematics**

**Q1. Choose correct answer from the following questions**

**8x1=8**

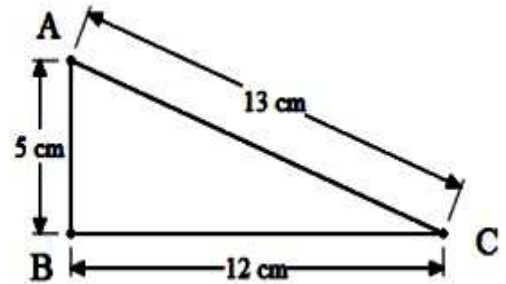
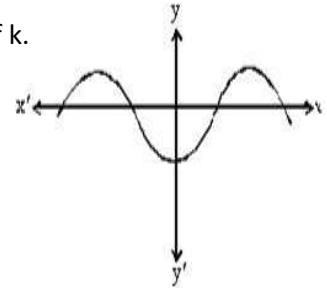
- 1) In an Arithmetic progression 2, 4, 6.....then the 5<sup>th</sup> term is
- a) 7  
b) 8  
c) 9  
d) 10
- 2) In the pair of linear equation  $a_1x + b_1y + c_1 = 0$  and  $a_2x + b_2y + c_2 = 0$ , if  $\frac{a_1}{a_2} \neq \frac{b_1}{b_2}$ , then the number of solutions are
- a) No solution  
b) One solution  
c) Two solution  
d) Many solution
- 3) The distance of a point (2, 3) from x-axis is
- a) 3  
b) 2  
c) 0  
d) 5
- 4) HCF of 3 and 7 is
- a) 5  
b) 7  
c) 1  
d) 35
- 5) The area of quadrant of circle of radius 7cm is
- a)  $36.5\text{cm}^2$   
b)  $24.5\text{cm}^2$   
c)  $72.5\text{cm}^2$   
d)  $38.5\text{cm}^2$
- 6) The degree of the polynomial  $x(x + 1)$  is
- a) 1  
b) 2  
c) 3  
d) 4
- 7) In the given figure the correct relation among the following
- a)  $\frac{AD}{AB} = \frac{AE}{EC}$   
b)  $\frac{AD}{AB} = \frac{AE}{AC}$   
c)  $\frac{AD}{DB} = \frac{AE}{AC}$   
d)  $\frac{AD}{AB} = \frac{DE}{AE}$
- 8) The Mean of first 10 natural numbers is
- a) 5.5  
b) 7.5  
c) 8.5  
d) 4.5



**Q2. Answer the following questions**

8x1=8

- 9) If the lines  $2x + 3y - 9 = 0$  and  $4x + ky - 18 = 0$  are coincident, then find the value of  $k$ .
- 10) In the given figure find the number of zeros of the polynomial  $P(x)$
- 11) Write the standard form of a quadratic equation
- 12) Find the zeros of the polynomial  $p(x) = 2x - 1$
- 13) If  $56 = 2^x \times 7^y$  find the value of  $x$  and  $y$
- 14) What is the tangent of a circle?
- 15) In the given figure find  $\sin A$
- 16) Write the empirical relationship between the three measures of central tendency.



**Q3. Solve the following questions**

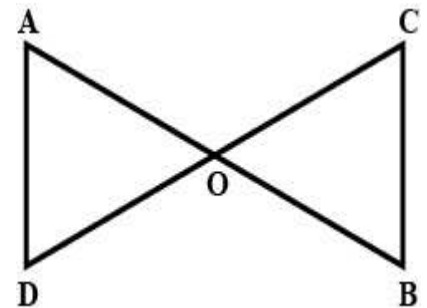
8x2=16

- 17) 3, 1, -1..... find the 5<sup>th</sup> term of the Arithmetic progression

OR

Find the sum of first 10 terms of the Arithmetic progression 2, 5, 8.....

- 18) Find the roots of the quadratic equation  $x^2 - 7x + 12 = 0$  by factorization method.
- 19) Solve  $x$  and  $y$  by elimination method  $2x + 3y = 14$  and  $2x + y = 10$ .
- 20) Write the formula to calculate total surface area and curved surface area of a cylinder whose radius is  $r$  and height is  $h$ .
- 21) Find the value of  $y$  for which the distance between the points  $P(2, -3)$  and  $Q(10, y)$  is 10 units.
- 22) In the given figure, if  $OA \cdot OB = OC \cdot OD$  show that  $LA = LC$  and  $LB = LD$ .



- 23) Two concentric circles of radii 5cm and 3cm find the length of the chord of the larger circle which touches the smaller circle.

- 24) Evaluate  $2 \tan^2 45^\circ + \cos^2 30^\circ - \sin^2 60^\circ$ .

OR

Evaluate  $\sin 60^\circ \cos 30^\circ + \sin 30^\circ \cos 60^\circ$ .

**Q4. Solve the following questions**

9x3=27

- 25) Find the zeroes of the quadratic polynomial  $P(x) = 3x^2 - x - 4$  and verify relation between the zeroes and the coefficients.
- 26) Roshan's mother is 26 years older than him and the product of their ages (in years) 3 years from now will be 360. Find the Roshan's present age.

OR

Find the two consecutive positive integers. Whose sum of squares is 365.

27) In a circle of radius 21cm an arc subtends an angle of  $60^\circ$  at the center. Find

- (i) The length of the arc                      (ii) Area of the sector formed by the arc.

**OR**

A chord of a circle of radius 15cm subtends an angle of  $60^\circ$  at the center. Find area of the corresponding minor and major segments of the circle (use  $\pi = 3.14$  and  $\sqrt{3} = 1.73$ )

28) In what ratio the point (-4, 6) divide the line segments joining the points A(-6, 10) and B(3, -8)

**OR**

Find the ratio in which the line segments joining the points (-3, 10) and (6, -8) is divided by (-1, 6)

29) Prove that  $\sqrt{3}$  is an irrational number

30) Prove that "The length of the tangents drawn from an external point of a circle are equal"

31) Prove that

$(1 + \cot A - \operatorname{cosec} A)(1 + \tan A + \sec A) = 2$  **OR**  $\frac{\sin A}{1 + \cos A} + \frac{1 + \csc A}{\sin A} = 2 \operatorname{cosec} A$

32) Find the mean of the following grouped data

C.I	10-20	20-30	30-40	40-50	50-60
Frequency	2	3	5	7	3

**OR**

Find the mode of the following grouped data

C.I	5-15	15-25	25-35	35-45	45-55
Frequency	3	4	8	7	3

33) A bag contains 3 red balls, 5 white balls and 8 blue balls one ball is taken out of the bag at random. Find the probability that the ball taken out is (i) A red ball (ii) Not a white ball

**Q5. Solve the following questions**

**4x4=16**

34) In an arithmetic progression the sum of 3<sup>rd</sup> and 6<sup>th</sup> term is 20 and the sum of 9<sup>th</sup> and 12<sup>th</sup> term is 44. Find the 25<sup>th</sup> term of the arithmetic progression.

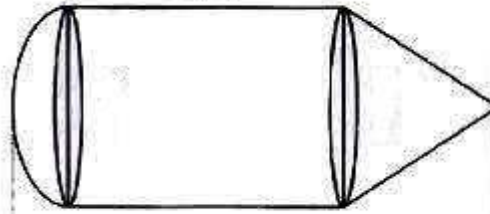
**OR**

In an arithmetic progression the 5<sup>th</sup> term is four more than twice the second term and the sum of 2<sup>nd</sup> and 4<sup>th</sup> term is 16. Find the 10<sup>th</sup> term of the arithmetic progression.

35) Solve graphically  $x + y = 6$  and  $2x - y = 3$

36) A 6 feet tall man stands on a table. He observes a flower on the floor. The angle of depression of the flower is  $60^\circ$  and the angle of elevation of the top of a table from the flower is  $45^\circ$ . Find the height of the table.

37) In a solid a hemisphere is surmounted by a cylinder of height 5cm and the other end of the cylinder is surmounted by a cone of height 3cm as shown in the figure. If the radius of the hemisphere is 7cm then find the volume of the solid.



**Q6. Solve the following question**

**5x1=5**

38) State and prove Thales theorem (Basic proportionality theorem)

DISRICT LEVEL SSLC MATHEMATICS QUESTION PAPER

BANGALORE SOUTH DISTRICT, SOUTH-4.

STD: 10<sup>TH</sup>

SUBJECT : MATHEMATICS (81E)

MARKS:80

TIME: 3Hr. 15min.

**I. Four alternatives are given for each of the following questions. Chose the correct alternative and write the complete answer along with its letter of alphabet**

1 X 8 = 8

1. The 10th term of the AP 5, 9, 13 ....is

- A)36                      B)31                      C)41                      D)21

2. The given linear pair of lines  $X - 2y = 0$  and  $3X + 4y - 20 = 0$  are

- A)Intersecting lines      B)Coincident lines      C)Parallel lines      D)Perpendicular lines

3. The degree of the polynomial  $4x^4 + 3x^3 + 2x - 5$  is \_\_\_\_\_

- A)1                      B)4                      C)2                      D)5

4. The standard form of the quadratic equation  $2x^2 = x - 7$  is

- A)  $2x^2 - x = -7$       B)  $2x^2 + x - 7=0$       C)  $2x^2 - x + 7=0$       D)  $2x^2 + x + 7=0$

5. The coordinates of the midpoint of the line segment joining the points A (2,3) and B(4,7) are

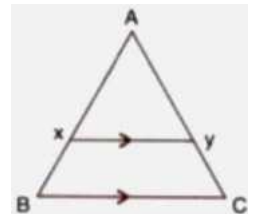
- A)(-3, -5)              B)(1,2)              C)(3,5)              D)(6,10)

6. If the HCF of 72 and 120 is 24, then their LCM is

- A)36                      B)720                      C)360                      D)72

7. In the  $\Delta ABC$ ,  $XY \parallel BC$  then

- A)  $\frac{AX}{AB} = \frac{AC}{AY}$       B)  $\frac{AX}{BX} = \frac{AY}{CY}$       C)  $\frac{AX}{BX} = \frac{XY}{AY}$       D)  $\frac{AB}{BX} = \frac{AC}{AY}$



8. The value of  $\cot 90^\circ$  is \_\_\_\_\_

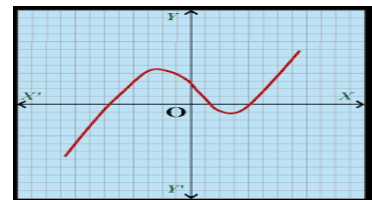
- A)  $\frac{1}{\sqrt{3}}$                       B) 1                      C)  $\sqrt{3}$                       D) 0

**II. Answer the following questions**

1 X 8 = 8

9. If the nth term of an AP is  $a_n = 3n - 2$  then find its 9th term.

10. In the given figure find the maximum number of zeros.



11. In the equation  $x + y = 7$  if  $x = 3$ , then find the value of Y

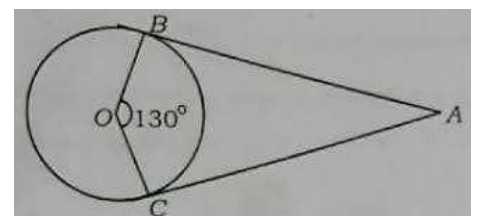
12. Write the formula for finding the length of an arc of a sector of a circle of radius r and angle  $\theta$ .

13. Find the surface area of sphere of radius 7 cm.

14. State Thales theorem.

15. Write the maximum number of tangents that can be drawn to a circle from an external point.

16. In the given figure find the value of  $\angle BAC$





### III. Answer the following questions

2 X 8 = 16

17. Find the sum of first 20 terms of the AP 2, 5, 8...

18. Solve  $2x + y = 8$

$$x - y = 1$$

19. Find the zeros of the polynomial  $p(x) = x^2 - 15x + 50$

OR

If p and q are the roots of the equation  $x^2 - 3x + 2 = 0$  find the value of  $\frac{1}{p} - \frac{1}{q}$

20. Find the distance between the points P (2,3) and Q(4,1) using distance formula

OR

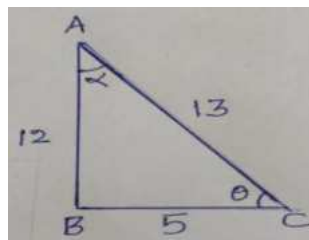
Find the coordinates of the point which divides the line joining the points A(1,6) and B(4,3) in the ratio 1:2 internally.

21. Prove that  $\sqrt{2} + 3$  is an irrational number.

22. Find HCF and LCM of 24, 36 and 48

23. In the given figure find the value of

1.  $\sin\theta$
2.  $\tan\alpha$



24. Find the mean for the given data 2, 4, 6, 8, 10.

### IV. Answer the following questions

3 X 9 = 27

25. Find the AP whose third term is 16 and its 7th term exceeds the 5th term by 12.

26. The altitude of a triangle is 6cm more than its base. If its area is  $108 \text{ cm}^2$  find the base and height of the triangle.

OR

Find two numbers whose sum is 27 and product is 182.

27. AB and CD are the arcs of two concentric circles with centre O of radius 21 cm and 7 cm respectively. If  $\angle AOB = 30^\circ$  as shown in the figure. Find the area of the shaded region

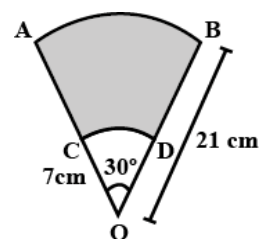
28. Show that the triangle whose vertices are A(8, -4) B(9, 5) and C(0, 4) is an isosceles triangle.

29. Prove that lengths of tangents drawn to a circle from an external point are equal.

30. Prove that  $\sec\theta(1 - \sin\theta)(\sec\theta + \tan\theta) = 1$

OR

Evaluate  $6 \cos 60^\circ - \sin 30^\circ + \sin^2 45^\circ + \cos^2 45^\circ$



31. Find the arithmetic mean for the following group data

CLASS INTERVAL	0-2	2-4	4-6	6-8	8-10
FREQUENCY	2	6	8	3	1

OR

Find the mode for the following group data

CLASS INTERVAL	0-6	6-12	12-18	18-24	24-30
FREQUENCY	2	9	15	12	5

32. A bag contains 3 red balls, 5 white balls and 8 blue balls. One ball is taken out of the bag at random. Find the probability that the ball taken out is

1. red ball
2. not a white ball

33. A girl of height 90 cm is walking away from the base of your lamp post at a speed of  $1.2 \text{ ms}^{-1}$ . If the lamp is 3.6 m above the ground, find the length of her shadow after 4 seconds

**V. Answer the following questions**

4 X 4 = 16

34. Solve graphically

$$x + 2y = 6$$

$$x + y = 5$$

35. Prove that if in two triangles, corresponding angles are equal, then their corresponding sides are in the same ratio and hence the two triangles are similar

36. The sum of the first three terms of an AP is 33. If the product of the first term and the third term exceeds the second term by 29 then find the AP

OR

The sum of the 5th and 9th terms of an AP is 40 and the sum of the 8th and 14th term is 64. Find the sum of first 20 terms

37. The angle of elevation of the top of an unfinished vertical building on a ground at a point which is 100 m from the base of the building is  $45^\circ$ . How much height the building must be raised, so that its angle of elevation from the same point be  $60^\circ$  (take  $\sqrt{3} = 1.73$ )

**VI. Answer the following questions**

5 X 1 = 5

38. A medicine capsule is in the shape of a cylinder, with hemispheres stuck to each of its ends. The length of the entire capsule is 14 mm and the diameter of the capsule is 5mm. Find its surface area and volume.

**DDPI OFFICE, DEPARTMENT OF SCHOOL EDUCATION**  
**BANGALORE SOUTH DISTRICT, KALASIPALYA, BANGALORE-02**

**SUBJECT: MATHEMATICS**

**PRACTICE PAPER 1**

**Q1. Choose correct answer from the following questions**

**8x1=8**

1) The prime factors of 72 is

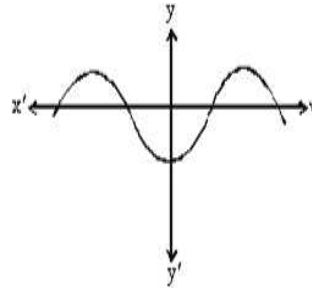
- |                     |                     |
|---------------------|---------------------|
| a) $2^4 \times 3^2$ | c) $2^4 \times 3^2$ |
| b) $2^3 \times 3^2$ | d) $2^2 \times 3^3$ |

2) The common difference of an Arithmetic progression 4, 7, 10, 13..... is

- |      |       |
|------|-------|
| a) 3 | c) 7  |
| b) 4 | d) 10 |

3) Find the number of zeros of p(x) in the given graph is

- |      |      |
|------|------|
| a) 1 | c) 4 |
| b) 2 | d) 5 |



4) If  $\sin A = \frac{4}{5}$ , then  $\operatorname{Cosec} A$  is

- |                  |                   |
|------------------|-------------------|
| a) $\frac{4}{5}$ | c) $\frac{5}{4}$  |
| b) $\frac{2}{5}$ | d) $\frac{8}{10}$ |

5) The probability of an event always lies between \_\_\_\_\_

- |            |             |
|------------|-------------|
| a) 1 and 2 | c) 0 and -1 |
| b) 2 and 3 | d) 0 and 1  |

6) The empirical relationship between the three measures of central tendency is

- |   |  |
|---|--|
| a) $3\text{median} = 2\text{mode} + 2\text{mean}$ | c) $3\text{median} = \text{mode} + 2\text{mean}$ |
| b) $2\text{median} = 3\text{mode} + \text{mean}$  | d) $\text{median} = 3\text{mode} + 2\text{mean}$ |

7) All \_\_\_\_\_ triangles are similar

- |              |                 |
|--------------|-----------------|
| a) Isosceles | c) Equilateral  |
| b) Scalene   | d) Acute angled |

8) Area of a sector of angle P (in degree) of a circle with radius R is

- |                            |                            |
|----------------------------|----------------------------|
| a) $\frac{P}{180} 2\pi R$  | c) $\frac{P}{360} 2\pi R$  |
| b) $\frac{P}{180} \pi R^2$ | d) $\frac{P}{360} \pi R^2$ |

**Q2. Answer the following questions**

**8x1=8**

9) Find the HCF of 12 and 15

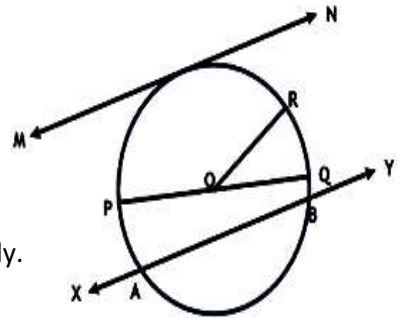
10) Find the missing term of an arithmetic progression 2  26

11) Reduce  $x(x + 3) = 4$  to standard form of quadratic equation

12) Write the formula to calculate the mid-point of the coordinates of the line segment joining  $A(x_1, y_1)$  and  $B(x_2, y_2)$

13) If  $P(A) = 0.09$ , then find  $P(\bar{A})$

14) In the given figure identify the secant.



15) Find surface area of the sphere whose radius is 7cm

16) Find the quadratic polynomial whose sum and product is 4 and 1 respectively.

**Q3. Solve the following questions**

**8x2=16**

17) Solve x and y by elimination method  $x + y = 14$  and  $x - y = 4$

18) Find the sum of first 22 terms of an arithmetic progression 8, 3, -2.....

19) Find the nature of the roots of the quadratic equation  $2x^2 - 3x + 5 = 0$

**OR**

Find the roots of the quadratic equation  $2x^2 + x - 6 = 0$  by factorization method

20) Find the zeros of the polynomial  $x^2 + 7x + 10$ . and verify the relationship between zeros and coefficients

21) Evaluate  $\frac{\cos 45^\circ}{\sec 30^\circ + \operatorname{cosec} 30^\circ}$

22) Find the coordinate of the point which divides the joining of (-1, 7) and (4, -3) in the ratio 2:3 internally.

**OR**

In what ratio does the point (-4, 6) divides the line segment joining the points A(-6, 10) and B(3, -8)

23) A box of 20 bulbs contains 4 defective once one bulb is drawn at random from the box. What is the probability of getting a bulb is defective.

24) A girl of height 90cm is walking away from the base of lamppost at a speed of 1.2m/s. if the lamp post is 3.6m above the ground, find the length of her shadow after 4 second.

**Q4. Solve the following questions**

**9x3=27**

25) Prove that  $\sqrt{3}$  is an irrational number

26) A fraction becomes  $\frac{9}{11}$ , if 2 added to both numerator and denominator. If 3 is added to both numerator and denominator it becomes  $\frac{5}{6}$ . Find the fraction.

**OR**

Five years ago Nuri was thrice as old as Sonu, 10 years later Nuri will be twice as old as Sonu. How old are Nuri and Sonu.

27) A train travels a distance of 480km at a uniform speed. If the speed had been 8km/h less, Then it would have taken 3hrs more to cover the same distance. Find the speed of the train.

28) if  $x = r \sin A \cos B$ ,  $y = r \sin A \sin B$  and  $z = r \cos A$ , then prove that  $x^2 + y^2 + z^2 = r^2$

**OR**

Prove that  $\frac{1 + \sec A}{\sec A} = \frac{\sin^2 A}{1 - \cos A}$

29) Check whether (5, -2) (6, 4) and (7, -2) are the vertices of an isosceles triangle

30) Find the mean of the following data

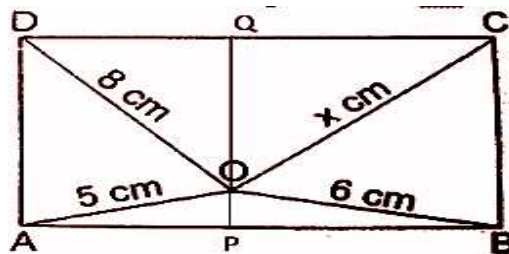
No. of plants	0-2	2-4	4-6	6-8	8-10	10-12	12-14
No. of houses	1	2	1	5	6	2	3

OR

Find the mode of the following data

Life time in hours	0-20	20-40	40-60	60-80	80-100	100-120
Frequency	10	35	52	61	38	29

31) In the figure, O is any point inside a rectangle ABCD such that OB = 6cm, OD = 8cm and OA = 5cm, find the length of OC



32) Prove that “The length of the tangents drawn from an external point of a circle are equal”

OR

Prove that “The tangent at any point of a circle is perpendicular to the radius through the point of contact”

33) A horse is tied to a peg at one corner of a square shaped grass field of a side 15m by means of a 5m 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 of the rope were 10m long instead of 5m (use  $\pi = 3.14$ )

**Q5. Solve the following questions**

**4x4=16**

34) If the sum of first 7 terms of an Arithmetic progression is 49 and that of its first 17 terms is 289. Find the sum of first n terms of Arithmetic progression.

OR

If the sum and product of first three terms in an Arithmetic progression are 33 and 1155 respectively. then find the value of its 11<sup>th</sup> term.

35) State and prove Thales theorem (basic proportionality theorem)

36) The angle of elevation of the top of a tower from a certain point is 30°, If the observer moves 20m towards the tower the angle of elevation of the top increases 15°. Find the height of the tower.

37) Solve graphically  $x + y = 5$  and  $2x - y = 1$

**Q6. Solve the following question**

**5x1=5**

38) A water bottle in the shape of 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<sup>2</sup>.

##### ALL THE BEST#####