**A**

**SL. No. : P**

ಒಟ್ಟು ಪ್ರಶ್ನೆಗಳ ಸಂಖ್ಯೆ : 40 ]
Total No. of Questions : 40 ]

[ ಒಟ್ಟು ಮುದ್ರಿತ ಪುಟಗಳ ಸಂಖ್ಯೆ : 12
[ Total No. of Printed Pages : 12

# CCE RF
# REVISED

ಸಂಕೇತ ಸಂಖ್ಯೆ : **81-E**

**Code No. : 81-E**

## ವಿಷಯ : ಗಣಿತ

## Subject : MATHEMATICS

**( ಇಂಗ್ಲಿಷ್ ಭಾಷಾಂತರ / English Version )**

**( ಹೊಸ ಪಠ್ಯಕ್ರಮ / New Syllabus )**

**( ಶಾಲಾ ಅಭ್ಯರ್ಥಿ / Regular Fresh )**

ದಿನಾಂಕ : 25. 03. 2019 ]

[ Date : 25. 03. 2019

ಸಮಯ : ಬೆಳಗ್ಗೆ 9-30 ರಿಂದ ಮಧ್ಯಾಹ್ನ 12-30 ರವರೆಗೆ ] [ Time : 9-30 A.M. to 12-30 P.M.

ಗರಿಷ್ಠ ಅಂಕಗಳು : 80 ]

[ Max. Marks : 80

**TEAR HERE TO OPEN THE QUESTION PAPER**
**ಪ್ರಶ್ನೆಪತ್ರಿಕೆಯನ್ನು ತೆರೆಯಲು ಇಲ್ಲಿ ಕತ್ತರಿಸಿ**

### General Instructions to the Candidate :

1. This Question Paper consists of 40 objective and subjective types of questions.
2. This question paper has been sealed by reverse jacket. You have to cut on the right side to open the paper 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.

**Tear here**

I. *Four* alternatives are given for each of the following questions / incomplete statements. Only one of them is correct or most appropriate. Choose the correct alternative and write the complete answer along with its letter of alphabet.

$8 \times 1 = 8$

1. If the *n*-th term of an arithmetic progression $a_n = 24 - 3n$, then its 2nd term is

   (A) 18 (B) 15

   (C) 0 (D) 2

2. The lines represented by $2x + 3y - 9 = 0$ and $4x + 6y - 18 = 0$ are

   (A) Intersecting lines

   (B) Perpendicular lines to each other

   (C) Parallel lines

   (D) Coincident lines

3. A straight line which passes through two points on a circle is

   (A) a chord (B) a secant

   (C) a tangent (D) the radius

4. If the area of a circle is $49\pi$ sq.units then its perimeter is

   (A) $7\pi$ units (B) $9\pi$ units

   (C) $14\pi$ units (D) $49\pi$ units

5. "The product of two consecutive positive integers is 30." This can be expressed algebraically as

   (A) $x(x + 2) = 30$

   (B) $x(x - 2) = 30$

   (C) $x(x - 3) = 30$

   (D) $x(x + 1) = 30$

6. If $a$ and $b$ are any two positive integers then HCF ( $a$, $b$ ) × LCM ( $a$, $b$ ) is equal to

(A) $a + b$ (B) $a - b$

(C) $a \times b$ (D) $a \div b$

7. The value of $\cos 48° - \sin 42°$ is

(A) 0 (B) $\frac{1}{4}$

(C) $\frac{1}{2}$ (D) 1

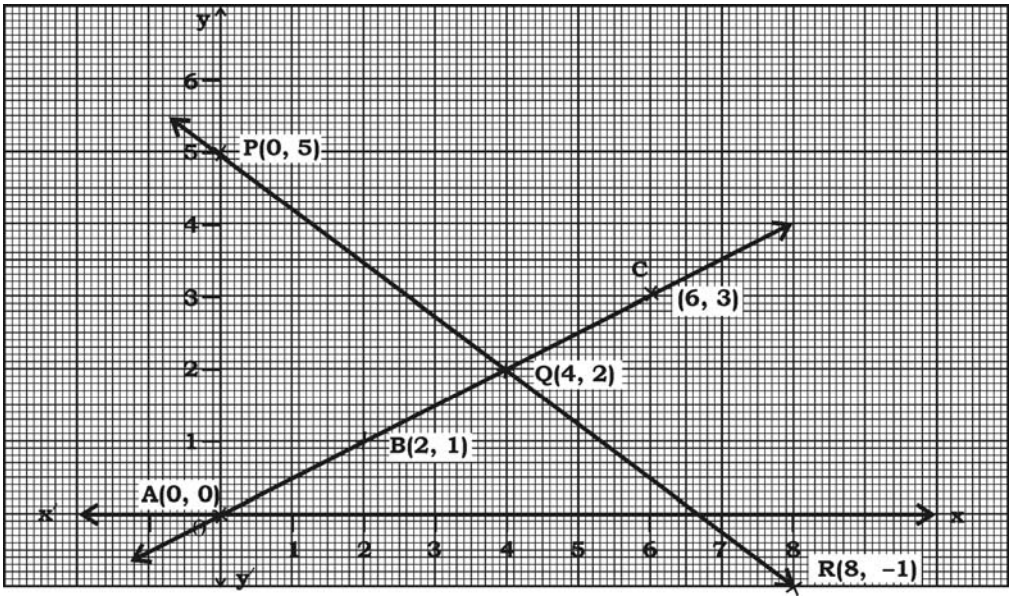
8. If $P(A) = 0{\cdot}05$ then $P(\overline{A})$ is

(A) 0·59 (B) 0·95

(C) 1 (D) 1·05

II. Answer the following : $6 \times 1 = 6$

9. The given graph represents a pair of linear equations in two variables. Write how many solutions these pair of equations have.



10. $17 = 6 \times 2 + 5$ is compared with Euclid's Division lemma $a = bq + r$, then which number is representing the remainder ?

11. Find the zeroes of the polynomial $P(x) = x^2 - 3$.

12. Write the degree of the polynomial $P(x) = 2x^2 - x^3 + 5$.

13. Find the value of the discriminant of the quadratic equation

$2x^2 - 4x + 3 = 0$.

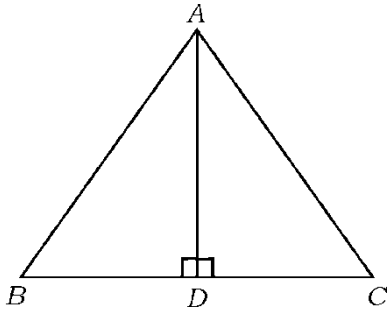
14. Write the formula to calculate the curved surface area of the frustum of a cone.

III. Answer the following :

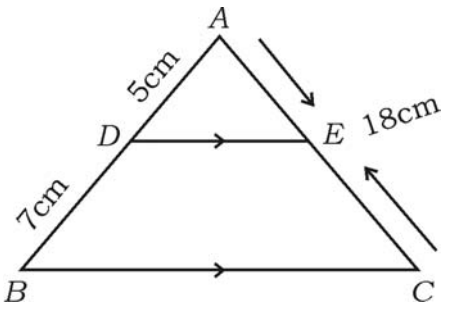
15. Find the sum of first twenty terms of Arithmetic series $2 + 7 + 12 + \ldots$ using suitable formula. 2

16. In $\Delta ABC$, $AD \perp BC$ and $AD^2 = BD \times CD$. Prove that

$AB^2 + AC^2 = (BD + CD)^2$. 2

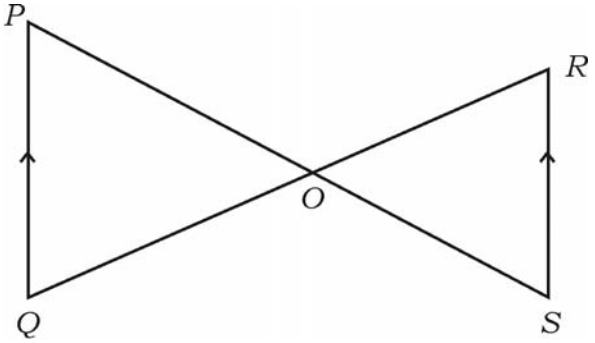


17. In $\Delta ABC$, $DE \parallel BC$. If $AD = 5$ cm, $BD = 7$ cm and $AC = 18$ cm, find the length of $AE$. 2




OR

In the given figure if $PQ \parallel RS$, prove that $\Delta POQ \sim \Delta SOR$.

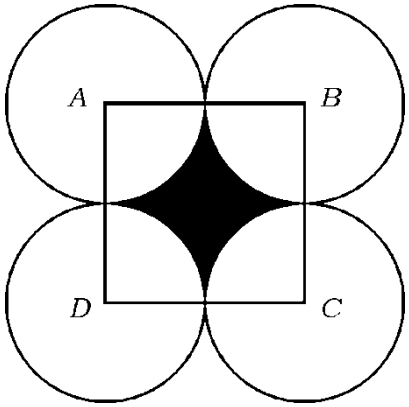



18. Solve the following pair of linear equations by any suitable method : 2

$x + y = 5$

$2x - 3y = 5.$

19. In the figure, $ABCD$ is a square of side 14 cm. $A$, $B$, $C$ and $D$ are the centres of four congruent circles such that each circle touches externally two of the remaining three circles. Find the area of the shaded region. 2



20. Draw a circle of radius 4 cm and construct a pair of tangents such that the angle between them is 60°. 2

21. Find the co-ordinates of point which divides the line segment joining the points $A$ ( 4, $-$ 3 ) and $B$ ( 8, 5 ) in the ratio 3 : 1 internally. 2

22. Prove that $3 + \sqrt{5}$ is an irrational number. 2

23. The sum and product of the zeroes of a quadratic polynomial $P(x) = ax^2 + bx + c$ are $-3$ and 2 respectively. Show that $b + c = 5a$. 2

24. Find the quotient and the remainder when $P(x) = 3x^3 + x^2 + 2x + 5$ is divided by $g(x) = x^2 + 2x + 1$. 2

25. Solve $2x^2 - 5x + 3 = 0$ by using formula. 2

26. The length of a rectangular field is 3 times its breadth. If the area of the field is 147 sq.m, find its length and breadth. 2

27. If $\sin\theta = \frac{12}{13}$, find the values of $\cos\theta$ and $\tan\theta$. 2

OR

If $\sqrt{3}\tan\theta = 1$ and $\theta$ is acute, find the value of $\sin 3\theta + \cos 2\theta$.

28. Prove that $\left(\frac{1+\cos\theta}{1-\cos\theta}\right) = (\operatorname{cosec}\theta + \cot\theta)^2$. 2

29. A cubical die numbered from 1 to 6 is rolled twice. Find the probability of getting the sum of numbers on its faces is 10. 2

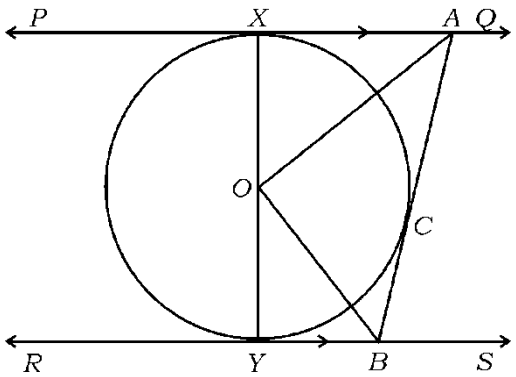
30. The radii of two circular ends of a frustum of a cone shaped dustbin are 15 cm and 8 cm. If its depth is 63 cm, find the volume of the dustbin. 2

IV. Answer the following :

31. Prove that "the lengths of tangents drawn from an external point to a circle are equal". 3

OR

In the given figure *PQ* and *RS* are two parallel tangents to a circle with centre *O* and another tangent *AB* with point of contact *C* intersecting *PQ* at *A* and *RS* at *B*. Prove that $\angle AOB = 90°$.



32. Calculate the median of the following frequency distribution table : 3

| *Class-interval* | *Frequency* ( $f_i$ ) |
|---|---|
| 1 — 4 | 6 |
| 4 — 7 | 30 |
| 7 — 10 | 40 |
| 10 — 13 | 16 |
| 13 — 16 | 4 |
| 16 — 19 | 4 |

$\Sigma f_i = 100$

OR

Calculate the mode for the following frequency distribution table.

| *Class-interval* | *Frequency* ( $f_i$ ) |
|---|---|
| 10 — 25 | 2 |
| 25 — 40 | 3 |
| 40 — 55 | 7 |
| 55 — 70 | 6 |
| 70 — 85 | 6 |
| 85 — 100 | 6 |

$\Sigma f_i = 30$

33. During the medical check-up of 35 students of a class, their weights were recorded as follows. Draw a less than type of ogive for the given data : 3

| *Weight ( in kg )* | *Number of students* |
|---|---|
| Less than 38 | 0 |
| Less than 40 | 3 |
| Less than 42 | 5 |
| Less than 44 | 9 |
| Less than 46 | 14 |
| Less than 48 | 28 |
| Less than 50 | 32 |
| Less than 52 | 35 |

34. The seventh term of an Arithmetic progression is four times its second term and twelfth term is 2 more than three times of its fourth term. Find the progression. 3

OR

A line segment is divided into four parts forming an Arithmetic progression. The sum of the lengths of 3rd and 4th parts is three times the sum of the lengths of first two parts. If the length of fourth part is 14 cm, find the total length of the line segment.

35. The vertices of a $\Delta$ *ABC* are *A* ( – 3, 2 ), *B* ( – 1, – 4 ) and *C* ( 5, 2 ). If *M* and *N* are the mid-points of *AB* and *AC* respectively, show that 2 *MN* = *BC*.

3

OR

The vertices of a $\Delta$ *ABC* are *A* ( – 5, – 1 ), *B* ( 3, – 5 ), *C* ( 5, 2 ). Show that the area of the $\Delta$ *ABC* is four times the area of the triangle formed by joining the mid-points of the sides of the triangle *ABC*.

36. Construct a triangle with sides 5 cm, 6 cm and 7 cm and then construct another triangle whose sides are $\frac{7}{5}$ of the corresponding sides of the first triangle. 3

V. Answer the following :

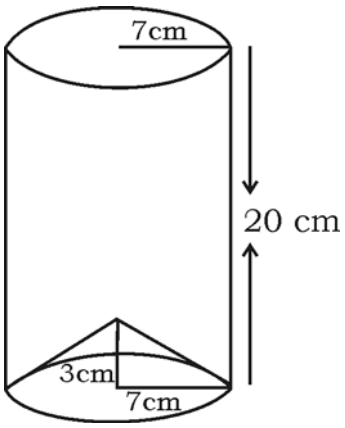
37. Find the solution of the following pairs of linear equation by the graphical method : 4

$2x + y = 6$

$2x - y = 2$

38. 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. 4

39. The bottom of a right cylindrical shaped vessel made from metallic sheet is closed by a cone shaped vessel as shown in the figure. The radius of the circular base of the cylinder and radius of the circular base of the cone are each is equal to 7 cm. If the height of the cylinder is 20 cm and height of cone is 3 cm, calculate the cost of milk to fill completely this vessel at the rate of Rs. 20 per litre. 4




OR

A hemispherical vessel of radius 14 cm is fully filled with sand. This sand is poured on a level ground. The heap of sand forms a cone shape of height 7 cm. Calculate the area of ground occupied by the circular base of the heap of the sand.

40. Prove that "the ratio of the areas of two similar triangles is equal to the square of the ratio of their corresponding sides". 4