No. of questions:38 Time: 3 hours	Subject Code: 81E Max. Marks : 80
I.Four alternatives are given to the followi	ng questions or incomplete statements.
Choose the correctfrom them and write i	t along with serial letter. $08  imes 01 = 08$
1) Coordinates of origin	
A) (1,1)	B)(2,2)
<i>C</i> ) (0,0)	D) (3,3)
2) The n <sup>th</sup> term of an arithmetic progr	ression is $4n^2 - 1$ . The $2^{nd}$ term is
<i>A</i> ) 0	<i>B</i> ) 2
<i>C</i> ) 15	<i>D</i> ) 10
3) In two linear equations if $\frac{a_1}{a_2} = \frac{b_1}{b_2}$	$= \frac{c_1}{c_2}$ then, those two straight lines are
A)intersecting	B) coincident
C) parallel	D) all of these
4) Which one of the following is equa	1 to sin 30°?
A) $\sqrt{3}$	B) $\frac{\sqrt{3}}{2}$
C) $\frac{1}{2}$	D) 0
5) $5^{\text{th}}$ term of the arithmetic progress	sion 5,9,13is
A) 36	B) 21
<i>C</i> ) 13	D) 25
6) If $(x + 4)(x - 3) = 0$ then, roots are	
A) (-4,3)	<i>B</i> ) (-4, -3)
<i>C</i> ) (4,3)	D) (0,0)
7) Number of zeroes of the polynom	ial represented by
the following graph	
A) 1	B) 2
<i>C</i> ) 3	D) 4
8) Irrational number among the follo	owing numbers
<i>A</i> ) $\sqrt{16} - \sqrt{9}$	B) $\frac{3}{4}$ $\frac{1}{x^{(-3)}-2} \begin{pmatrix} -1 & 0 \\ -1 & 0 \\ -1 & 0 \\ -1 & 1 \end{pmatrix} \begin{pmatrix} 2 & 3 \\ -3 & x^{+1} \end{pmatrix}$
<i>C</i> ) 0.3333	D) $2 + \sqrt{3}$

# II. Answer the following questions.

- 9) Write the formula of finding the length of the arc of a circle with angle at the centre' $\theta'$  and radius 'r'.
- 10) Find the surface area of a sphere having radius 7cm.
- 11) $\Delta$ ABCand  $\Delta$ DEF similar triangles. Their areas are 25cm<sup>2</sup> and 16cm<sup>2</sup> respectively. Find the ratio of their corresponding sides.
- 12) Write the formula of finding the volume of frustum of a cone.
- 13) Find the distance between origin and the point (5, -4).

 $\mathbf{08}\times\mathbf{01}=\mathbf{08}$ 

- 14) Find the discriminant of the quadratic equation  $2x^2 3x 7 = 0$ .
- 15) Write the degree of the polynomial  $p(x) = x^3 3x^4 + x^2 + x 3$ .
- 16) L. C. M of 24 and 36 is 72. Find H.C.F.

## III. Answer the following questions.

### $\mathbf{08}\times\mathbf{02}=\mathbf{16}$

- 17) Find the zeroes of the polynomial  $x^2 2x 8 = 0$  and verify the relationship between the zeroes and the coefficients.
- 18) A box contains 50 discs which are numbered from 1 to 50. A child picks up one card at random. What is the probability of picking a perfect square numbered disc ?
- 19) Find the sum of first 24 terms of the arithmetic progression 5,8,11,14, ... ...
- 20) In the figure shown below  $\triangle ABC$ and  $\triangle DBC$  are two triangles on the same base BC. AD intersects BC at 'O'. If  $AL \perp$  $BC \text{ and } DM \perp BC$  then prove that  $\frac{Area \ of \triangle ABC}{Area \ of \triangle DBC} = \frac{AO}{DO}$ .



## OR

In the figure XY || BC, AX = p - 3, BX = 2p - 2 and  $\frac{AY}{CY} = \frac{1}{4}$ . Find the value of 'p'



21) If  $15 \cot A = 8$ , find sin A find sec A.

22) Solve : 10x + 3y = 75, 6x - 5y = 11

23) Prove that  $3 - \sqrt{5}$  is a irrational number.

#### OR

Find the H.C.F of135and 225 using Euclid's division algorithm.

24)Construct a pair of tangents to a circle of radius 4cm which are inclined to each other at an angle of 70 °.

### IV. Answer the following questions.

25) In the figure ABC is a quadrant of the circle of radius 14cm and a semicircle is drawn with BC as diameter. Find the area of the shaded region.



26) Vertices of a rhombus are (3,0), (4,5), (-1,4) and (-2,-1). Find its area.

## OR

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

27) Divide  $3x^2 - x^3 - 3x + 5$  by  $x - 1 - x^2$  and verify the division algorithm.

## OR

On dividing  $x^3 - 3x^2 + x + 2$  by a polynomial g(x), the quotient and remainder were (x - 2) and (-2x + 4) respectively. Find g(x).

28) Prove that 
$$\frac{1-\tan^2 A}{1+\tan^2 A} = 1 - 2\sin^2 A$$

- 29) From the top of a 24m high building, the angle of elevation of the top of a tower is 60° and the angle of depression of its foot is 30°. Determine the height of the tower.
- 30) In an arithmetic progression the sum of 4<sup>th</sup> and 8<sup>th</sup> terms is 24 and the sum of 6<sup>th</sup> and 10<sup>th</sup> is 44. Find the first 3 terms.

## OR

In an arithmetic progression the ratio between the  $7^{th}and$  the  $3^{rd}$  term is12:5 . Find the ratio between  $13^{th}$  and  $4^{th}$  term.

31) For the following data draw more than type ogive.

Class Interval	40 - 45	45 - 50	50 – 55	55 – 60	60 - 65	65 – 70
Frequency	4	6	16	20	30	24

32) Prove that the lengths of tangents drawn from an external point to 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) Solve graphically : 3x + y = 11, x - y = 1

## V. Answer the following questions.

- 34)In a hospital sewage water is collected in a cylindrical tank having diameter 2m and altitude 5m. The water is used to irrigate a park having length 25m and breadth 20m. If the cylindrical tank was completely filled with water find the height of the water in the park.
- 35) The mode of the following data is 15. Find the Mean of this data. By using empirical relationship between mean, median and mode, find median.

Class Interval	Frequency
1 – 5	7
5 – 9	2
9 – 13	2
13 – 17	8
17 – 21	1

36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes 36)Two pipes together takes 36)Two pipes together can fill a tank in 6 hours 20 minutes. One tap takes active takes

## OR

Students of 10<sup>th</sup> standard of a school planned a picnic at the cost of Rs.480. Had 3 more students join the picnic the cost of the picnic for each student would have decreased by Rs.8. How many students participated in the picnic.

37)Draw a  $\triangle ABC$  with side AB = 5 cm, BC = 7 cm and  $\angle B = 60^{\circ}$ . Then construct a triangle whose sides area  $\frac{3}{5}$  times the corresponding sides of  $\triangle ABC$ .

# VI. Answer the following questions.

 $\mathbf{01} \times \mathbf{05} = \mathbf{05}$ 

38)State and prove Pythagoras theorem.