## SSLC MATHS MODEL QUESTION PAPER -10: 2019-20

No. of questions: 38
Subject Code: 81E
Time: 3 hours
I.Four alternatives are given to the following questions or incomplete statements. Choose the correctfrom them and write it along with serial letter. $08 \times 01=08$

1) In an arithmetic progression if $S_{1}=5, S_{2}=12$ then, the value of ' $d$ ' is
A) -2
B) 1
C) 2
D) 3
2) If the two straight lines are parallel then the ratio of their coefficients is
A) $\frac{a_{1}}{a_{2}}=\frac{b_{1}}{b_{2}}=\frac{c_{1}}{c_{2}}$
B) $\frac{a_{1}}{a_{2}} \neq \frac{b_{1}}{b_{2}}$
C) $\frac{a_{1}}{a_{2}}=\frac{b_{1}}{b_{2}} \neq \frac{c_{1}}{c_{2}}$
D) $\frac{a_{1}}{a_{2}} \neq \frac{b_{1}}{b_{2}}=\frac{c_{1}}{c_{2}}$
3) In the equation $a x^{2}+b x+c=0$ if $a=0$ then the equation is
A) quadratic equation
B) cubic equation
C) linear equation
D) none of these
4) L.C.M of 18 and 45 is
A) 81
B) 45
C) 90
D) 9
5) The coordinates of origin are
A) $(1,1)$
B) $(0,0)$
C) $(2,2)$
D) $(3,3)$
6) If $\sin \theta=\frac{4}{5}$ then the value of $\operatorname{cosec} \theta$ is
A) $\frac{3}{4}$
B) $\frac{4}{3}$
C) $\frac{4}{5}$
D) $\frac{5}{4}$
7) In the figure $L M \| C B$ and $L N \| C D$ then $\frac{A M}{A B}$ is equal to

A) $\frac{A N}{A D}$
B) $\frac{\mathrm{AL}}{\mathrm{LC}}$
C) $\frac{A D}{A N}$
D) $\frac{B C}{D C}$
8) The area of the largest circle that can be drawn in a square of side 14 cm .
A) $121 \mathrm{~cm}^{2}$
B) $154 \mathrm{~cm}^{2}$
C) $169 \mathrm{~cm}^{2}$
D) $196 \mathrm{~cm}^{2}$
II. Answer the following questions.
9) If the angle formed at the centre of the circle is $\theta$ then, write the formula of finding the area of the sector of the circle.
10) The ratio between the height of a tree and the length of its shadow is $1: \frac{1}{\sqrt{3}}$. What is the angle of elevation of the sun?
11) Express 140 as the product of prime factors.
12) What is the distance between origin and the point ( $x, y$ )?
13) Write the formula of finding the sum of first $n$ terms of an arithmetic progression having first term ' $a$ ' and the last term ' 1 '.
14) Mention the nature of the roots if $b^{2}-4 a c=0$
15) Find the number of zeroes of the polynomial having graph as shown below?

16) What is the sum of zeroes of the polynomial $x^{2}-7 x+9$ ?

## III. Answer the following questions.

$08 \times 02=16$
17) $\triangle A B C \sim D E F$ and their areas are 64 sq. cm and $121 \mathrm{sq} . \mathrm{cm}$. If $E F=15.4 \mathrm{~cm}$, find $B C$.

OR
$\triangle A B C$ is an isosceles triangle with $A C=B C$. If $A B^{2}=2 A C^{2}$. Prove that $\triangle A B C$ is a right angled triangle.
18) A die is thrown once. Find the probability of getting
a) a number larger than 4
b) a triangular number.
19) To a circle of radius 3.5 cm draw a pair of tangents from an external point 7 cm away from the centre.
20) In the figure, arcs of equal radius of 14 cm . are drawn at each vertex of a equilatrial triangle. Find the area of shaded region.

21) Prove that $\sqrt{2}$ is irrational.

OR
Using Euclid's division algorithm find the H.C.F of 455 and 42.
22) Solve : $y-x+2=0, x-2 y-4=0$
23) Solve using formula: $x^{2}-7 x=12$
24) The area of a right angled triangle is $600 \mathrm{~cm}^{2}$. If its base is 10 cm larger than its altitude, find its base and altitude.

## IV. Answer the following questions.

$09 \times 03=27$
25) A vessel is in the form of an inverted cone. Its height is 8 cm and the radius of its top,which is open,is 5 cm .It is filled with water up to the brim. When lead shots,each of which is a sphere of radius 0.5 cm are dropped into the vessel,one-fourth of the water flows out. Find the number of lead shots dropped in the vessel.

26) Water is collected from a roof of a complex. Roof has $20 \mathrm{~m} \times 20 \mathrm{~m}$ area. This water is filled in a cylindrical drum of diameter 2 m and height 3.5 m . Find the height of the water present in the roof.
$27)$ Find the area of the triangle having vertices $(1,1),(-4,6)$ and $(-3,-5)$

## OR

Check whether the points $\mathrm{A}(1,5), \mathrm{B}(2,3)$ and $\mathrm{C}(-2,-1)$ are collinear.
28) Prove that $\frac{1}{\operatorname{cosec}-\cot A}-\frac{1}{\sin A}=\frac{1}{\sin A}-\frac{1}{\operatorname{cosec} A+\cot A}$
29) Prove that the tangent at any point of a circle is perpendicular to the radius through the point of contact .

## OR

Prove that tangents drawn from an external point to a circle are equal.
30) The following distribution gives the daily income of 50 workers of a factory.

| Daily <br> Income <br> (in Rs) | $100-120$ | $120-140$ | $140-160$ | $160-180$ | $180-200$ |
| :---: | :---: | :---: | :---: | :---: | :---: |
| Number of <br> students | 12 | 14 | 8 | 6 | 10 |

Convert the distribution above to a less than type cumulative distribution, and draw its ogive.
31) The sum of the digits of a two digit number is 9 . Also, nine times this number is twice the number obtained by reversing the order of the digits. Find the number.

## OR

A fraction becomes $\frac{9}{11}$, if 2 is added to both the numerator and the denominator. If 3 is added to both the numerator and denominator it becomes $\frac{5}{6}$. Find the fraction.
32) Solve graphically: $2 x+y=5, x+y=3$
33) Divide $\left(3 x^{2}-x^{3}-3 x+5\right)$ by $\left(x-1-x^{2}\right)$ and find the quotient and remainder.

## OR

On dividing $x^{3}-3 x^{2}+x+2$ by a polynomial $g(x)$, the quotient and remainder were $x-2$ and $-2 x+4$ respectively. Find $g(x)$.
V. Answer the following questions.
$04 \times 04=16$
34)The angle of elevation of an aeroplane from a point on the ground is $45^{\circ}$. After 15 seconds, the angle of elevation reduces to $30^{\circ}$. If an aroplane fly at constant altitude of 2500 m find the speed of the aeroplane.
35)Construct a right triangle in which the sides other than the hypotenuse are of lengths 4 cm and 3 cm . Then construct another triangle whose sides are ${ }_{5}^{7}$ times the corresponding sides of the given triangle.
36)3 ${ }^{\text {rd }}$ term of an arithmetic progression is larger than the first term by 12 .If the last term is 205 and the $5^{\text {th }}$ term is 25 find the number of terms of the arithmetic progression.

OR
An arithmetic progression having 4 terms has sum equal to 68 and the product of its middle two terms is 280 . Find these 4 terms..
37)A survey conducted on 20 households in a locality by a group of students resulted in the following frequency table for the number of family members in a house hold.Find the mean and the mode of this data.

| Size of family | Number of families |
| :---: | :---: |
| $1-3$ | 7 |
| $3-5$ | 8 |
| $5-7$ | 2 |
| $7-9$ | 2 |
| $9-11$ | 1 |

VI. Answer the following questions.
$01 \times 05=05$
38) State and prove Thale's theorem.

