S.S.L.C. MODEL EXAMINATION 2014

MATHEMATICS

Time : 2½ hours *Total Score : 80*

Instructions:

- Read the questions carefully, understand each question and then answer the questions.
- Give explanations wherever necessary.
- If there is an OR between any two questions, you may answer only one among them.
- 15 minutes will be given at the beginning as cool off time. This time may be utilised to read and understand the questions.
- Simplification using $\sqrt{2}$, π etc. with their approximate values is not required if not specified in the question.

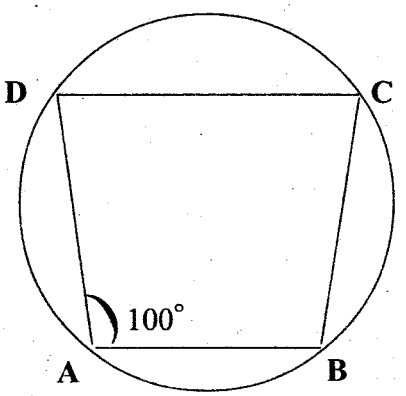
SCORE

1. n^{th} term of a sequence is $\frac{n^2+n}{2}$, then 2

(a) Write the sequence.

(b) Check whether this sequence is an arithmetic sequence.

2. (a) 2

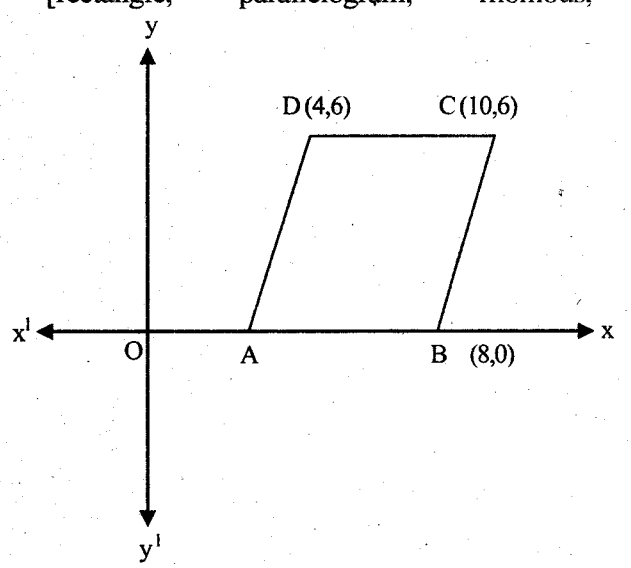


In the figure, ABCD is a cyclic quadrilateral if $\angle DAB = 100°$ find $\angle BCD$.

(b) Write the cyclic quadrilaterals among the following.

[rectangle, parallelogram, rhombus, trapezium, isosceles trapezium]

3. 2



ABCD is a parallelogram as shown in the figure.

(a) Find the length of AB?

(b) Write the co-ordinates of A.

SCORE

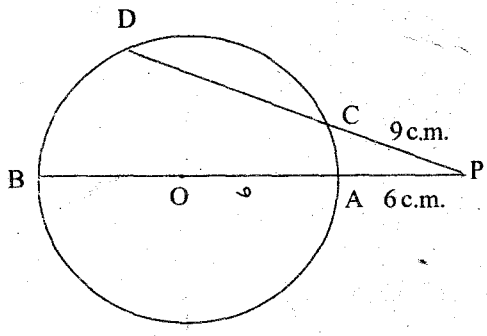
4. If x+4, 3x–2, 4x–2, ...are in arithmetic sequence, then 3

(a) Find the value of x.

(b) Write the sequence.

(c) Find the n^{th} term of the sequence.

5. 3



In the figure, P is an exterior point of the circle. A line is drawn at P cutting the circle at two points C and D. PC= 9 centimetre, PA=6 centimetre and O is the centre of the circle. Shortest distance from P to the circle is same as the radius.

(a) Find the radius of the circle.

(b) Find CD.

6A. Play ground of a school is in the shape of a rectangle. Length of the ground is 5 metre more than its breadth. Area is 500 square metres. 3

(a) If x is the breadth of the ground, find its length.

(b) Find the length and breadth of the ground.

OR

B. The sum of two numbers is 9 and their sum of squares is 41.

(a) Taking one number as x, form an equation in x.

(b) Find the two numbers.

7. Two persons are standing at opposite directions of a flag post of height 75 metre at an equal distance from the base of the flag post and looking the tip of the flag post at an angle of elevation 45°. Find the distance between the two persons? 3

8. A circular sheet of radius 18 centimetre is divided into 9 equal sectors. 3

(a) Find the measure of the central angle of a sector.

(b) Find the slant height of a cone which can be made by a sector.

(c) Find the lateral surface area of the cone thus formed.

SCORE

9. The point (–8, 8) lies on a line parallel to the X-axis and the point (6, –5) lies on line parallel to Y-axis 3

(a) Draw X-axis and Y-axis and hence draw the parallel lines containing these points.

(b) Write the co-ordinates of the point of intersection of these lines.

(c) Find the distance between the origin and this point of intersection.

10. A box contains slips of all three digit numbers. 3

(a) How many slips does the box have?

(b) Taking a slip without looking into it, what is the probability of getting a slip showing identical digits?

11. (a) Check whether (x+1) is a factor of the polynomial $P(x)= x^3+6x^2+11x+6$. 3

(b) If (x+2) is another factor of P(x), find the third factor.

12. Two lines x–2y+6=0 and 2x+y+2=0 intersect at the point A. 3

(a) Write the co-ordinates of A.

(b) Prove that the two lines are perpendicular to each other?

13. Daily wages and number of workers working in a company are listed below: 3

Daily wages (in Rupees)	Number of workers
400	4
450	5
500	6
550	4
600	3
650	2
700	1

(a) What is the total daily wages of all workers?

(b) Find the mean of their daily wages.

14. An arithmetic sequence has first term 18 and common difference 3. 4

(a) Write the sequence

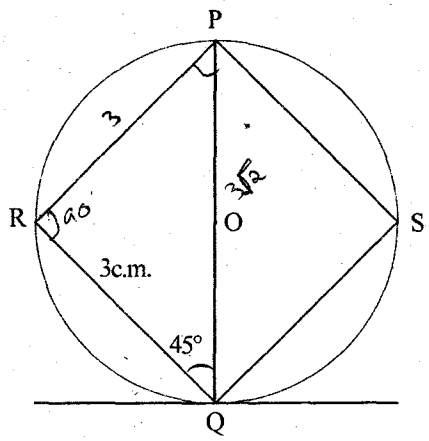
(b) Write a sequence by taking the terms of the above arithmetic sequence which are perfect squares.

(c) Is this new sequence an arithmetic sequence? Why?

SCORE

15. Draw a circle of radius 5 centimetre. Draw a triangle with angles 30°, 70°, 80° whose vertices are on the circle. Write the measure of the length of all sides of this triangle. 4

16. 4



In the figure, PQ is the diameter of the circle. If ∠ PQR=45° and QR=3cm, then

(a) Find ∠ PRQ.

(b) What is the radius of the circle?

17. A. Draw a triangle with sides 8 centimetre, 10 centimetre and 12 centimetre and hence draw its in.circle. Write the measure of its in radius. 4

OR

B. Draw a circle of radius 4 centimetre. Draw a chord PQ of length 5 centimetre in it. Also draw tangents at P and Q and mark the point of intersection of these tangents.

18. (a) Find the reminder of the polynomial 4

$s(x)=x^3+6x^2+11x-3$ when it is divided by (x+1) and (x+2).

(b) If (x+1) and (x+2) are factors of the polynomial $p(x) = x^3+6x^2+11x-3+k$, then find the value of k.

19. The following table gives the classification of cows in a dairy farm according to the quantity of milk given by each in a day. 4

Amount of milk (in litre)	Number of cows
0—2	1
2—4	3
4—6	14
6—8	17
8—10	26
10—12	10
12—14	13
14—16	12
16—18	10

(Contd.)

SCORE

(a) Find the number of cows in the dairy farm to give 10 litres of milk or less

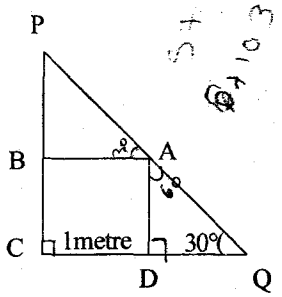
(b) Find the median of the quantity of milk in a day.

20. Common difference of two arithmetic sequences are equal. First terms of the two sequences are 5 and 8 respectively.

(a) Find the difference between 11th terms of the two sequences.

(b) If the product of 11th terms of the two sequences is 2160, then find the 11th term of the two sequences

21 A.



In the figure, ABCD is a square with each side 1 metre and ∠ PQC=30°.

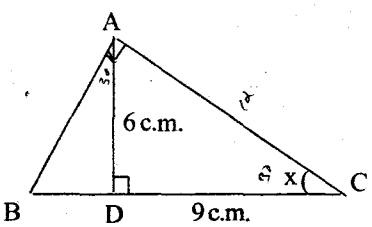
(a) Find ∠ PAB.

(b) Find the length of AQ and AP.

(c) In triangle PCQ, find the length of the sides PC and CQ.

OR

B.



In the figure, ∠ BAC = 90°, AD = 6 cm., CD = 9 cm., ∠ ACD = x and AD ⊥ BC

(a) Find tan x.

(b) Find the measure of ∠ BAD

(c) Find the length of AC and BD.

22 A. A cylindrical shaped vessel of radius 18 centimetre and height 24 centimetre is filled with milk using a measuring vessel in the shape of a cone of radius 12 centimetre. When milk is poured 6 times with the conical vessel, the cylindrical vessel becomes full. Then 5

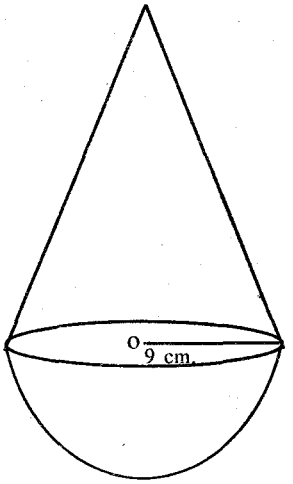
(a) Find the height of the conical vessel.

(b) What is the volume of the measuring vessel?

($\pi \approx 3.14$)

OR

B.



A solid is formed by joining a hemisphere and a cone of same radius as shown in the figure. The hemisphere is of radius 9 centimetre and total height of the solid is 21 centimetre.

(a) Find the height of the cone.

(b) Find the volume of the cone.

(c) Find the volume of the solid.

23. If P (0, 2) and Q (2, 4) are two points of a line PQ, then 5

(a) Find the slope of the line PQ.

(b) Write the equation of line PQ. Also check whether (1, 3) is a point on this line.

(c) Prove that any point on this line will have y co-ordinate 2 more than x co-ordinate.