

SSLC MODEL EXAMINATION—FEBRUARY, 2012

MATHEMATICS

Time: 2½ Hours

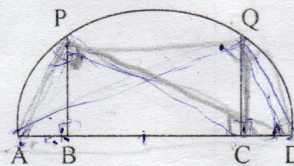
Total Score: 80

Instructions:

1. Read the instructions of each question and answer.
2. Explain the answer wherever necessary.
3. Avail 15 minutes as cool off time and read the questions carefully.
4. If there is an 'OR' mentioned in between two questions, answer only one among them.
5. Simplification of irrationals such as  $\pi, \sqrt{2}$  etc. with its approximate value is not required, if not specified in the question.

Score

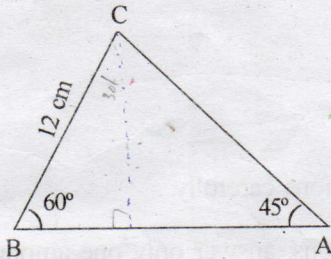
1. Write the sequence obtained by multiplying each odd number starting from 1, by 2 and adding 3. Does it form an arithmetic sequence? [2]
2. In the quadrilateral ABCD,  $\angle A=80^\circ$ ,  $\angle C=70^\circ$ ,  $\angle D=120^\circ$ . If we draw a circle with AC as diameter, where is the position of B with reference to this circle? [2]
3. What are the peculiarities of the line joining the points A (-2, 3) and B (5, 3)? [2]  
Write any two points on this line other than these.
4. Write the sequence formed by the integer terms of the arithmetic sequence  $\frac{19}{8}, \frac{11}{4}, \frac{25}{8}, \dots$ . Is 47 a term of this sequence? [3]
5. In the figure, AD is the diameter of the semi circle. [3]  
BP and CQ are perpendicular to AD. Prove that  $AB = CD$ .



6. Ammu has a savings box. She deposits 1 Rupee on the first day, 2 Rupees on the second day, 3 Rupees on the third day and so on in the box. After some days she found 171 Rupees in the box. How many days did she take for this total deposit? [3]

7. A pole is erected perpendicular to the ground and a rope is fastened from the top of the pole to the ground. The rope makes an angle of  $45^\circ$  with the ground. The rope touches the ground at a distance of 12 metres from the foot of the pole. When the foot of the rope is shifted towards the pole it makes  $60^\circ$  with the ground. Draw a rough figure showing these facts. Find the shifted distance. [3]

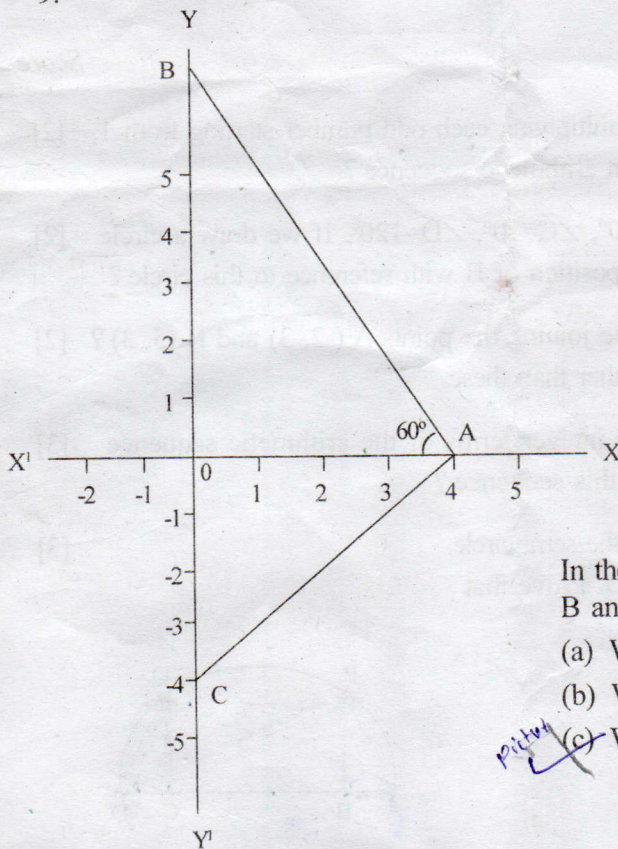
OR



In the figure  $\angle A = 45^\circ$ ,  
 $\angle B = 60^\circ$  and  $BC = 12$  centimetre.  
 Calculate the length of  $AB$ .

8. The side of a solid cube is 12 centimetre. What is the slant height of the largest square pyramid that can be made from this cube? [3]

9.



In the figure A is a point on the X-axis.  
 B and C are points on the Y-axis.

- (a) Write the coordinates of A.  
 (b) Write the coordinates of C.  
 (c) Write the coordinates of B.

10. Lots numbered 1 to 10 are placed in two boxes. Take one lot each from the two boxes by closing the eyes. [3]

- (a) What is the probability of getting the same number in each lot?  
 (b) What is the probability of getting the prime number in each lot?  
 (c) What is the probability that one number is the square of the other?

2, 4, 9, 4, 5, 6, 7, 8, 9, 10  
 56

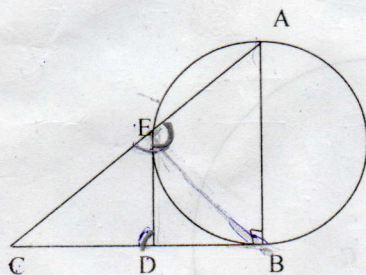
11. Write the polynomial  $2x^2 - 13x + 6$  as the product of two first degree polynomials. [3]
12. A (1, 2), B (6, 3), C (5, 8), D (0, 7) are the vertices of the quadrilateral ABCD. [3]  
What is the peculiarity of its diagonals?
13. The table below shows the classification of 100 pupils in a school according to their height. [3]

Height (in centimetre)	Number of Pupils
130-135	20
135-140	25
140-145	30
145-150	15
150-155	10

Find the mean height.

14. Appu claims that the sum of continuous terms from the first term of the arithmetic sequence 4, 12, 20, ..... is always a perfect square. Do you agree with Appu? Why? What is the difference between the sum of the first 10 terms and the next 10 terms of this sequence? [4]
15. Draw a circle of radius 3.5 centimetre. Construct a triangle whose two angles are  $50^\circ$  and  $100^\circ$  in such a way that the drawn circle is the circum circle of this triangle. Write the length of the largest side of this triangle. [4]

16.



In the figure  $\triangle ABC$  is a right angled triangle. The circle drawn with AB as diameter intersect AC at E. The tangent at E intersect BC at D. What is the measure of  $\angle BEA$ ? Prove that  $\angle CED = \angle ECD$ .

17. The radius of the incircle of a triangle is 2.5 centimetre. Measure of two angles of the triangle are  $50^\circ$  and  $60^\circ$ . Construct the triangle and write the measure of its sides. [4]

OR

Draw a circle of radius 3 centimetre. Mark the point P, 7 centimetre away from the centre of the circle. Construct the two tangents from P to the circle. Write the length of the tangents.

18. What first degree polynomial is to be added to  $2x^3 - 9x^2$  to get a polynomial having  $(x-2)$  and  $(x-3)$  as factors? [4]
19. The table below shows the classification of 50 people in a village according to their daily income. [4]

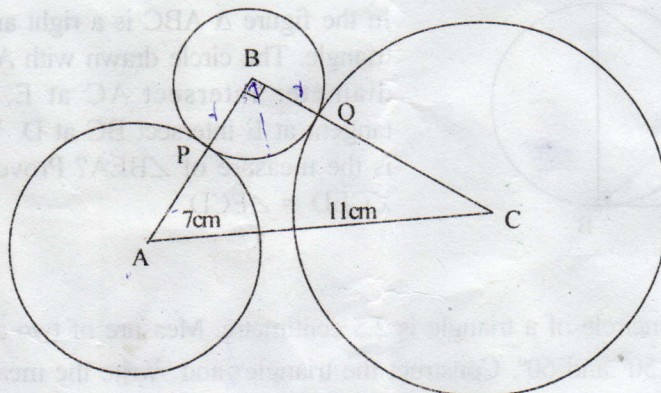
Daily income (in Rupees)	Number of People
125-135	4
135-145	6
145-155	10
155-165	15
165-175	8
175-185	4
185-195	3

- (a) To which class the median belongs?  
 (b) Find the median of the daily income.
20. The two sides of a triangular card sheet is 15 centimetre and 18 centimetre. If the angle between them is  $70^\circ$ , [5]
- (a) Find the area of the triangular sheet.  
 (b) Find the length of the third side of the sheet.  
 (Sin  $70^\circ = 0.9397$ , cos  $70^\circ = 0.3420$ , tan  $70^\circ = 2.7475$ )



21.

[5]



In the figure  $\Delta ABC$  is a right angled triangle. A circle of radius 7 centimetre is drawn with centre A and another circle of radius 11 centimetre is drawn with centre at C. A circle centred at B touches the other two circles at P and Q.

- (a) If we take the radius of the circle centred at B as 'r' what is AB?  
 (b) If  $AC = 20$  centimetre, find r.

22. A sector with central angle  $288^\circ$  is cut off from a circular tin sheet of radius 15 centimetre. The sector is then rolled up to a conical vessel of maximum size. What is the height of the vessel? This conical vessel is filled with water and then completely poured into hemispherical vessels of diameter 6 centimeter each. How many such hemispherical vessels are required? [5]

OR

- A solid metal cone with radius 6 centimetre and height 24 centimetre is melted and recasted into 8 solid spheres of equal size. What is the radius of such a sphere? What is the total surface area of these spheres?
23. What is the slope of the line passing through the points A (1,-3) and B(3, 3)? [5]  
Prove that the equation of this line is  $\frac{x}{2} - \frac{y}{6} = 1$ . Write the coordinates of the points at which this line intersects the X-axis and Y-axis.

OR

Write the coordinates of the point of intersection of the lines  $x-2y + 8 = 0$ ,  $2x + y + 1 = 0$ . Write the coordinates of the points where these lines intersect the Y-axis. Find the distance between any two of these three points.

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