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Prescribed by SCERT Kerala Education Board

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Kerala SSLC

QUESTION BANK

With Complete Solutions

FOR
2017
EXAM

CLASS 10

MATHEMATICS
(PART - 2)

Based on Latest SCERT Textbook
issued by Department of Education,
Government of Kerala in 2016

BENEFITS

- **Includes Latest Board Question Paper** with Scheme of Evaluation.
- **Question are strictly based on the Latest SCERT Textbook** issued in 2016.
- **Includes 'Think Tank' Questions** for high analytic skill development.
- **Solutions of SCERT Kerala Textbook Questions** are given for effective comprehension of the concepts.
- **Includes Exam Oriented Question** for better preparation.
- **Chapterwise / Topicwise** introduction is given to enable quick revision.
- **Know the terms / facts / formulae / links** are given to aid in-depth study.
- **Flowcharts** are given to visualize better understanding of the concepts.

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(Issued by SSLC Board in November 2016)**

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***NOTE:** This is the November Examination Paper issued by SSLC Board for Class 10th. It contains questions from both Part-I & Part-II of the SCERT Textbook. This Oswaal Question Bank is exclusively based on SCERT Textbook Part II. In order to purchase Oswaal Part-I Question Bank contact your closest bookseller (*refer to the distributor list*) or log on to www.oswaalbooks.com; flipkart.com; amazon.in.

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PREFACE

Malcolm Forbes said “Education's purpose is to replace an empty mind with an open one” and this is something which is always followed by Government of Kerala, Department of Education, whether through their education system framework or recent enhancement in their curriculum. The aim of their Curriculum is not just to let learners obtain basic knowledge but to make them life-long learners.

The purpose of this book is to nurture individuality and thus enhance one's innate potentials which help in increasing the self-study mode for students. This book strengthens knowledge and attitude related to subject. This book is designed in such a way that students can set their own goals and can improve their problem solving and thinking skills.

This book is strictly as per the latest SCERT Kerala Textbook, introduced by SSLC Board in 2016. It follows the latest syllabus prescribed by the board. It contains all types of questions like Textbook Questions, VSA Questions (Very Short Answer), SA Questions (Short Answer), MCQs (Multiple Choice Questions) and LA Questions (Long Answer). A synopsis is given for every chapter which contains important points from that chapter. Each chapter has high quality figures wherever required for better, fast and clear understanding.

OSWAAL SSLC Question Bank is different and better in terms of High Quality Questions which are developed by 'OSWAAL Expert Panel' which ensures success in examination. The Question Bank is arranged 'Topic-Wise' where each topic from every chapter is explained in detail. High quality figures and Flow charts are given to improve retention of concepts.

Through OSWAAL Books students are taught how to think, not what to think. We at OSWAAL Books try to use quality content, standard language, creativity and high quality figures, which makes readers to enjoy it because we believe if our readers don't enjoy reading our book then there is no use in reading it at all. This is one of the reasons that the scope of this book extends from students to teachers. Teachers can use this book as a perfect teaching guide and students can use this book for good learning and practice.

At last we would like to thank our authors, editors, reviewers and specially students whom we request to send suggestions regularly which will help in continuous improvement of this book and will make this book “One of the Best”. Wish you all Happy Learning.

–*Publisher*

Why Topic Wise Question Banks Are A Better Choice than Previous Year's Papers ?

| Question Banks | Previous Years' Papers |
|--|---|
| <ol style="list-style-type: none">1. Chapter-wise and Topic-wise presentation in Question Banks facilitates systematic study.2. Question Banks can be referred to by the students throughout the year as well as at the completion of each chapter in school.3. Question Banks, take into account any changes in syllabus or layout and hence are fully updated and aligned as per the latest specifications by the Board. | <ol style="list-style-type: none">1. Year Wise presentation restricts methodical flow of learning.2. These can be referred to only after the completion of the full syllabus in school.3. Previous Years' questions cannot be changed and hence fail to be adept with the latest Board specifications |

FIRST TERMINAL EVALUATION - 2016
MATHEMATICS
(Issued by SSLC Board in November, 2016)

Standard : X

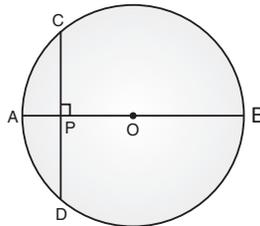
Score : 80

Time : 2½ hour

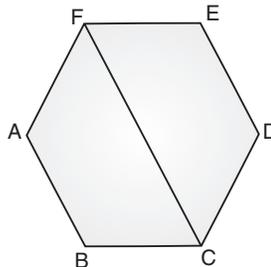
General Instructions :

- (i) The first 15 minutes is given as 'cool off time'. You may read and understand the questions during this time.
- (ii) Answer all the questions.
- (iii) If there is an OR between any two questions, you may answer one among them.
- (iv) Simplification using irrationals like π , $\sqrt{2}$, $\sqrt{3}$ etc., with their approximate values is not required if not specified in the question.

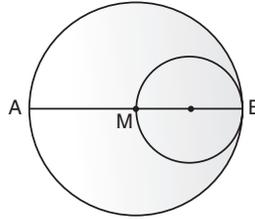
1. 98 is a term of the arithmetic sequence having common difference 7. Is 2016 a term of this sequence ? why ? 2
2. One angle of a triangle is 130° . If we draw a circle with diameter as the opposite side of this angle, examine whether the vertex is inside, outside or on the circle. 2
3. (i) What is the sum of first 20 natural numbers ?
 (ii) The algebraic form of an arithmetic sequence is $6n + 5$. Find the sum of the first 20 terms of this sequences. 3
4. 12 balls are in box. 5 among them are blue and others are black. Without looking into the box, one ball is taken.
 (i) Find the probability of getting a blue ball.
 (ii) After putting one blue and one black ball into the box, a ball is taken. Is the probability of getting a blue ball increases or decreases ? Justify your answer. 3
5. In the figure, AB is a diameter of the circle and the chord CD is perpendicular to AB . If $CD = 4\sqrt{5}$ centimetres and $PA = 2$ centimetres, find AB . 3



6. Consider the arithmetic sequence 171, 167, 163
 (i) Is '0' a term of this sequence ? Justify.
 (ii) How many positive terms are in this sequence ? 3
7. The difference of the length of perpendicular sides of a right triangle is 10 centimetres. Its area is 72 square centimetres. Find the length of the perpendicular sides. 3
 Also, find the inverse of f .
8. Examine whether the two quadrilaterals obtained by joining the vertices F and C of a regular hexagon $ABCDEF$ are cyclic or not ? Why ? 3

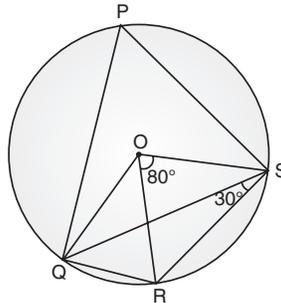


9. 10^{th} term of an arithmetic sequence is 82. If its common difference is 8, find the position of the term 250 in the sequence ? 3
10. In the figure M is the centre of the larger circle. A smaller circle is drawn with diameter as the radius of the larger circle as shown in the figure. Without looking into the figure, a point is marked.
 What is the probability that the point is inside the smaller circle ?
 What is the probability that the point is outside the smaller circle ? 3



OR

- (i) How many distinct 3 digit numbers can be written using the digits 4, 6 and 9 without repeating the digits ?
 (ii) What is the probability that the numbers are odd numbers ?
 (iii) What is the probability that the numbers are even numbers ?
11. Consider the arithmetic sequence 10, 17, 24,
- (i) What is its algebraic form ?
 (ii) Prove that there is no perfect square in this sequence. 4
12. In the figure P, Q, R and S are the points on the circle with centre at O . If $\angle ROS = 80^\circ$ and $\angle QSR = 30^\circ$; compute the following angles.

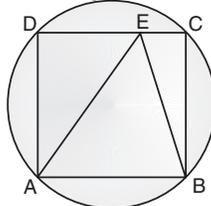


- (i) $\angle OSQ = \dots\dots\dots$ 4
 (ii) $\angle OSQ = \dots\dots\dots$
 (iii) $\angle P = \dots\dots\dots$ 4
 (iv) $\angle QOR = \dots\dots\dots$
13. All the terms of an arithmetic sequence with common difference 4 are positive numbers. The product of two consecutive terms of this sequence is the same as their sum.
- (i) If one of them is x , what is the next term ?
 (ii) Calculate those terms. 4
14. Construct a triangle with two angles 45° and 60° and its circumradius 3.5 centimetres. Measure the sides of this triangle. 4
15. In an arithmetic sequence, m times the n^{th} term is equal to n times the m^{th} term. Prove that its first term and common difference are equal. 4

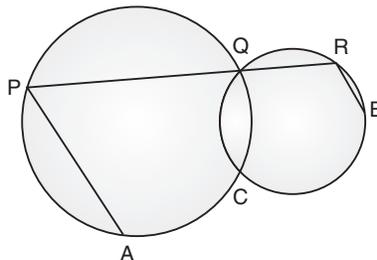
OR

The algebraic form of an arithmetic sequence is $7n + 3$.

- (i) What is the remainder when each term of this sequence is divided by 7 ?
 (ii) How many numbers are there in between 100 and 300 in this sequence ?
16. In the figure, $ABCD$ is a square. Without looking a point is marked in the figure.
- (i) Find the probability that the marked point lies inside the square ?
 (ii) Find the probability that the point lies in triangle ABE ?



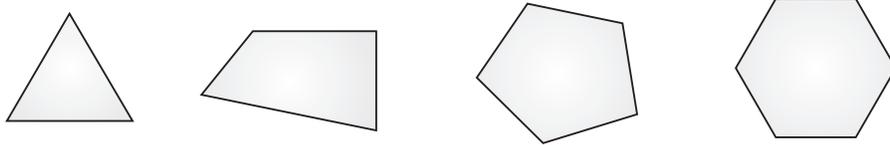
17. Two circles are intersecting at Q and C as shown in the figure. RB is parallel to PA . Prove that the points A, C, B lie on the same line. 4



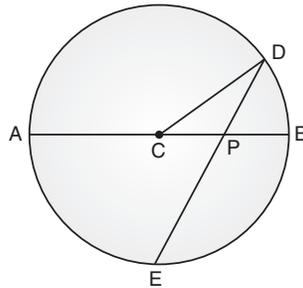
4

OR

- Prove that the quadrilateral obtained by joining any two alternate vertices of a regular pentagon is cyclic. 4
18. Construct a square of area 12 square centimetres. 4
19. Polygons like triangle, quadrilateral, pentagon, hexagon are drawn as shown below by increasing the number of sides one at a time.



- (i) Write the sequence of the sum of the angles of each polygon.
 (ii) Write down the number of possible diagonals in each polygon as a sequence.
 (iii) Write down the algebraic form of the above two sequence.
20. In the figure, C is the centre of the circle and AB , its diameter. ΔPDC is an isosceles triangle. Prove that $AB^2 = 4PD \times DE$.

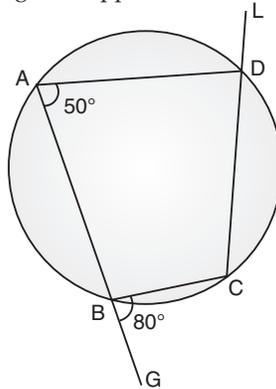


OR

5

In the figure, quadrilateral $ABCD$ is cyclic.
 $\angle GBC = 80^\circ$; $\angle A = 50^\circ$.

- (i) Compute the other angles of quadrilateral. Find also $\angle ADL$?
 (ii) Prove that the sum of the exterior angles at opposite vertices of a cyclic quadrilateral is 180° .



21. Observe the number pattern made using the terms of the arithmetic sequence 3, 7, 11

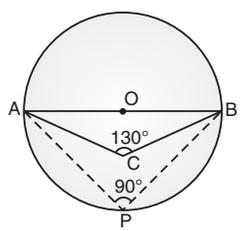
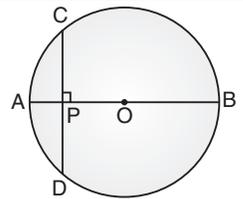
3
 7 11
 15 19 23
 27 31 35 39

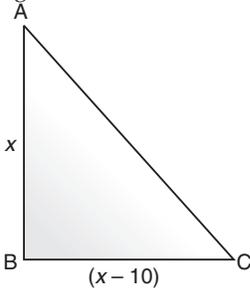
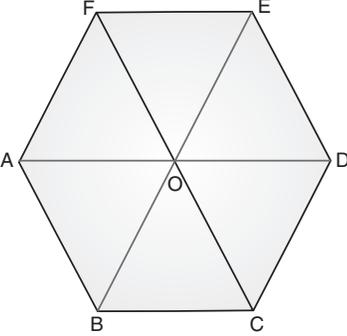
- (i) Write the next two lines.
 (ii) Which term of the arithmetic sequence 3, 7, 11, is the last number of the 15th row of the above pattern?
 (iii) Find the first and last numbers in the 15th line? 5
22. Draw a rectangle having length 7 centimetres and breadth 3 centimetres. Construct another rectangle having the same area and one side 8 centimetres. 5



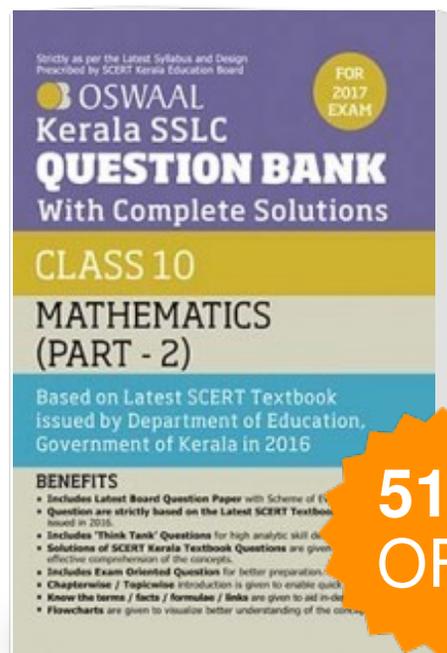
SOLUTIONS

(Scheme of Valuation, 2016)

| Q. No. | Answer | Sub Score | Total Score |
|--------|---|------------------|-------------|
| 1. | 2016 – 98 = 1918 1918 is a multiple of 7 hence 2016 is a term of the sequence. | 1 1 | 2 |
| 2. | For drawing a rough figure using the data given in the question For writing the vertex is inside the circle with correct explanation [Scheme of Valuation, 2016] Detailed Answer : <div style="text-align: center;">  </div> <p>Since angle in a semicircle is 90°. $130^\circ > 90^\circ$, there fore point C lies inside the circle.</p> | 1 1 1 1 | 2 |
| 3. (i) | For finding the sum = $\frac{20 \times 21}{2} = 210$ | | 3 |
| (ii) | For finding $x_1 = 11$ and $x_n = 125$ For finding the sum = $\frac{20}{2}(11 + 125) = 10 \times 136 = 1360$ | 1 1 1 | |
| 4. (i) | For writing probability of getting a blue ball = $\frac{5}{12}$ | 1 | |
| (ii) | If one blue and one black ball is added Probability of getting a blue ball = $\frac{6}{14}$ or $\frac{3}{7}$ For writing probability of getting a blue ball increases | 1 1 1 | 3 |
| 5. | <div style="text-align: center;">  </div> <p>For finding $PC = PD = 2\sqrt{5}$ cm and for writing $PA \times PB = PC^2$ For finding $PB = 10$ cm For finding the diameter of the circle = $10 + 2 = 12$cm</p> | 1 1 1 | 3 |
| 6. (i) | For writing $X_n = 175 - 4n$ and for writing $175 - 4n = 0$ and hence 0 is not a term of the sequence | 1 | |
| (ii) | For finding 43 rd term of the sequence = $175 - 172 = 3$ For writing there are 43 positive terms in this sequence (Any other equivalent answers may be accepted) | 1 1 | 3 |

| | | | |
|-----------|---|----------------------|----------|
| <p>7.</p> | <p>For taking the perpendicular sides as x and $x - 10$ For forming a second degree equation $x^2 - 10x = 144$ For solving the equation and for writing sides as 8 cm and 18 cm [Scheme of Valuation, 2016]</p> <p>Detailed Answer : Let the triangle be ABC right angled at B.</p>  <p>We know that, area of the triangle ABC</p> $= \frac{1}{2} \times BC \times AB$ <p>$\Rightarrow 72 = \frac{1}{2} (x - 10) (x)$</p> <p>$\Rightarrow 144 = x^2 - 10x$</p> <p>$\Rightarrow x^2 - 10x - 144 = 0$</p> <p>$\Rightarrow x^2 - 18x + 8x - 144 = 0$</p> <p>$\Rightarrow x(x - 18) + 8(x - 18) = 0$</p> <p>$\Rightarrow (x - 18) (x + 8) = 0$</p> <p>$\Rightarrow x = 18, -8$</p> <p>$\therefore$ Sides are $x = 18$ and $x - 10 = 8$ cm.</p> | <p>1 1 1</p> | <p>3</p> |
| <p>8.</p> |  | | |
| | <p>Call the centre as O. The diagonals FC, BE, AD meet at the centre O and we have 6 equilateral triangles. $\angle ABC$ is angle $ABO + \angle OBC = 120^\circ$ $\angle AFC = \angle AFO = 60$ degrees. Hence $\angle ABC + \angle AFC = 180^\circ$. Similarly, we check that the sum of the angles CDE and EFC is $60 + 120 = 180^\circ$. Thus $ABCF$ and $CDEF$ are cyclic.</p> | <p>1 1 1</p> | <p>3</p> |
| <p>9.</p> | <p>For finding the first term = 10 For writing 31st term = 250 using proper steps Detailed Answer : Let a be the first term and d be the common difference. Given that, $a_{10} = 82$ $\Rightarrow a + 9d = 82$ Given that $d = 8$ $\Rightarrow a + 9 \times 8 = 82$ $a = 82 - 72$ $a = 10$</p> | <p>1 2</p> | |

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