



**INDIAN SCHOOL SOHAR**  
**PRE-BOARD II EXAMINATION (2021-22)**  
**BASIC MATHEMATICS (CODE-241)**

**CLASS: X**  
**DATE: 24.03.2022**

**MAX. MARKS: 40**  
**TIME: 2 Hours**

**GENERAL INSTRUCTIONS:**

1. The question paper consists of 14 questions divided into 3 sections A, B, C.
2. All questions are compulsory.
3. Section A comprises of 6 questions of 2 marks each. Internal choice has been provided in two questions. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question. Section C comprises of 4 questions of 4 marks each. An internal choice has been provided in one question. It contains two case study-based questions.

**SECTION: A**

1. Find the value of P from the following data if its mode is 48.

Class	Frequency
0-10	7
10-20	14
20-30	13
30-40	12
40-50	P
50-60	18
60-70	15
70-80	8

2. 100 surnames were randomly picked up from a local telephone directory and the frequency distribution of the number of letters in the English alphabet in the surnames was obtained as follows. Determine the median number of letters in the surnames.

Number of letters	Number of surnames
1-4	6
4-7	30
7-10	40
10-13	16
13-16	4
16-19	4

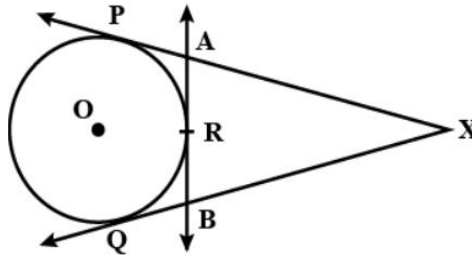
3. The circumference of the base of a 9 m high wooden solid cone is 44 m. Find the volume of it.
4. If one root of the quadratic equation is  $2x^2 - 3x + p = 0$  is 3, find the other root of the quadratic equation

5. Which term of the AP is 5, 9, 13, ... is 81? Also find the sum  $5 + 9 + 13 + \dots + 81$ .

OR

An AP consists of 25 terms. If the 13th term is 50, find the sum of all terms of the AP.

6. If XP and XQ are tangents from X to the circle with centre O. R is a point on the circle. Prove that  $XA + AR = XB + BR$ .



OR

Prove that the angle between the two tangents drawn from an external point to a circle is supplementary to the angle subtended by the line segment joining the points of contact at the centre.

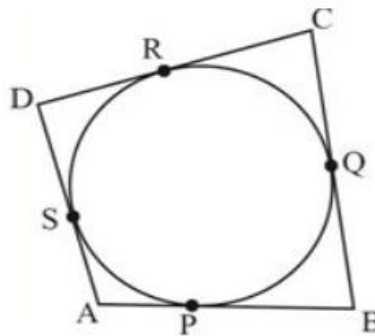
### SECTION: B

7. If the sum of first 7 terms of an AP is 49 and that of 17 terms is 289, find the first term and common difference.
8. A kite is flying at a height of 60m above the ground. The string attached to the kite is temporarily tied to a point on the ground. The inclination of the string with the ground is  $60^\circ$ . Find the length of the string assuming that there is no slack in the spring.

OR

A person standing on the bank of the river observes that the angle of elevation of the top of a tree standing on the opposite bank is  $60^\circ$ . When he was 40 m away from the bank, he finds that the angle of elevation to be  $30^\circ$ . Find the height of the tree.

9. A quadrilateral ABCD is drawn to circumscribe a circle. Prove that  $AB + CD = AD + BC$ .



10. The sum of the 4<sup>th</sup> and 8<sup>th</sup> terms of an AP is 24 and the sum of the 6<sup>th</sup> and 10<sup>th</sup> terms is 44. Find the first three terms of the AP.

### SECTION: C

11. The following age wise chart of 300 passengers flying from Delhi to Pune is prepared by the Airlines staff. Find the mean age of the passengers.

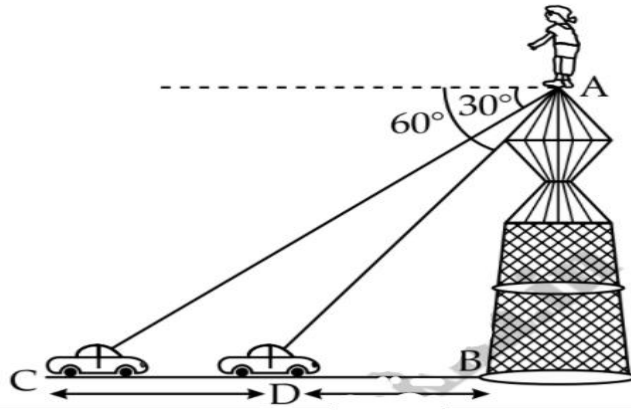
Age	Less than 10	Less than 20	Less than 30	Less than 40	Less than 50	Less than 60	Less than 70	Less than 80
Number of passengers	14	44	82	134	184	245	287	300

12. Draw a pair of tangents to a circle of radius 6cm which are inclined to each other at an angle of  $60^\circ$ .

OR

Draw a circle of radius 3 cm. Take two points P and Q on one of its extended on both sides of its centre, each at a distance of 7 cm on opposites of its centre. Draw tangents to the circle from each of these two points P and Q.

13. A straight highway leads to the foot of tower. A man standing at the top of the tower observes a car at an angle of depression of  $30^\circ$ , which is approaching the foot of the tower with a uniform speed. Six seconds later, the angle of depression of the car is found to be  $60^\circ$ .



- (i). Find the height of the tower.
- (ii) Find the time taken by the car to reach the foot of the tower from point D to B.

14. Mathematics teacher of a school took her 10<sup>th</sup> standard students to show red fort. It was a part of their educational trip. The teacher had interest in history as well. She narrated the facts of red fort to students. Then the teacher said in this monument one can find combination of solid figures. There are 2 pillars which are cylindrical in shape. Also 2 domes at the corners which are hemispherical. 7 smaller domes at the centre.



- (i) Find the lateral surface area of two pillars if height of the pillar is 7m and radius of the base is 1.4m.
- (ii) What is the ratio of sum of volumes of two hemispheres of radius 1cm each to the volume of a sphere of radius 2 cm?

\*\*\*\*\* THE END \*\*\*\*\*