



**SAMPLE PAPER 1 TERM 2**

**Class 10 - Mathematics**

**Time Allowed: 2 hours**

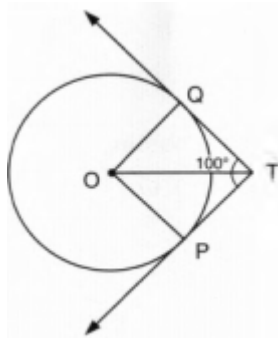
**Maximum Marks: 40**

**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.
4. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in one question.
5. 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 sum of first 20 terms of the sequence whose  $n^{\text{th}}$  term is  $a_n = An + B$ . [2]
2. Find the roots of the quadratic equation  $100x^2 - 20x + 1 = 0$  by factorization. [2]
3. Two tangents TP and TQ are drawn from an external point T to a circle with centre O as shown in Figure. If they are inclined to each other at an angle of  $100^\circ$ , then what is the value of  $\angle POQ$ ? [2]



4. A girl empties a cylindrical bucket full of sand, of base radius 18 cm and height 32 cm, on the floor to form a conical heap of sand. If the height of this conical heap is 24 cm then find its slant height correct to one place of decimal. [2]
5. Given below is a cumulative frequency distribution showing the marks secured [2]

Marks	Number of students
Below 20	17
Below 40	22
Below 60	29

Below 80	37
Below 100	50

Form the frequency distribution table for the above data.

6. Solve the quadratic equation by factorization: [2]

$$\frac{16}{x} - 1 = \frac{15}{x+1}, x \neq 0, -1$$

OR

Solve:  $10x - \frac{1}{x} = 3$

### Section B

7. The observations 29, 32, 48, 50, x, x + 2, 72, 78, 84, 95 are arranged in ascending order. What is the value of x if the median of the data is 63? [3]

8. Draw a circle of radius 3.5 cm. Draw two tangents to the circle which are perpendicular to each other. [3]

9. Find the median of the following frequency distribution: [3]

Weekly wages (in ₹)	60-69	70-79	80-89	90-99	100-109	110-119
No. of days	5	15	20	30	20	8

10. A kite is flying, attached to a thread which is 165 m long. The thread makes an angle of 30° with the ground. Find the height of the kite from the ground, assuming that there is no slack in the thread. [3]

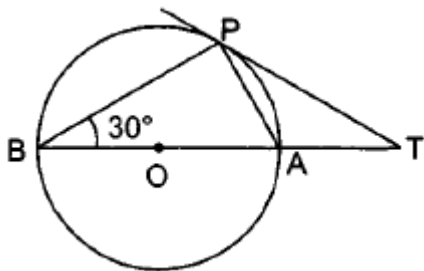
OR

From a top of a building 100 m high the angle of depression of two objects are on the same side observed to be 45° and 60°. Find the distance between the objects.

### Section C

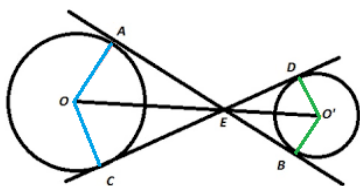
11. The perimeters of the two circular ends of a frustum of a cone are 48 cm and 36 cm. If the height of the frustum is 11 cm, find its volume and curved surface area. [4]

12. In figure, O is the centre of the circle and TP is the tangent to the circle from an external point T. If  $\angle PBT = 30^\circ$ , prove that  $BA : AT = 2:1$ . [4]



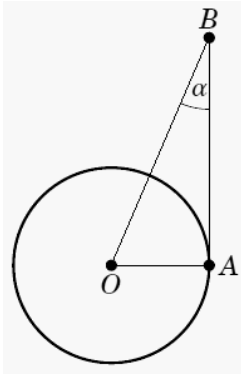
OR

The common tangents AB and CD to two circles with centres O and O' intersect at E. Prove that points O, E and O' are collinear



13. Let O be the center of the earth. Let A be a point on the equator, and let B represent an object (e.g. a star) in space, as shown in the figure. If the earth is positioned in such a way that the [4]

angle  $\angle OAB = 90^\circ$ , then we say that the angle  $\alpha = \angle OBA$  is the equatorial parallax of the object.



The equatorial parallax of the sun has been observed to be approximately  $\alpha = 0.00244^\circ$ . The radius of the earth is 3958.8 miles. Given:  $\sin \alpha = 4.26 \times 10^{-5}$  and  $\tan \alpha = 4.25 \times 10^{-5}$

- i. Estimate the distance from the center of the earth to the sun.
  - ii. Can we say in this problem points O and A are approximately the same points? If yes, how?
14. Akshat's father is planning some construction work in his terrace area. He ordered 360 bricks [4] and instructed the supplier to keep the bricks in such a way that the bottom row has 30 bricks and next is one less than that and so on.



The supplier stacked these 360 bricks in the following manner, 30 bricks in the bottom row, 29 bricks in the next row, 28 bricks in the row next to it, and so on.

- i. In how many rows, 360 bricks are placed?
- ii. How many bricks are there in the top row?

**For solution click here <https://youtu.be/Enq6eSBDwwM>**

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