| Roll Number | | |
|---|---|---|

SET A

# INDIAN SCHOOL MUSCAT
## SECOND PRE-BOARD EXAMINATION
## MATHEMATICS (041)

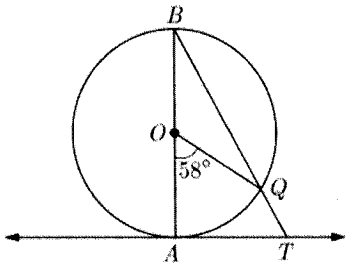
CLASS: X | TERM II | Time Allotted: 2 Hrs.

27.02.2022 | Max. Marks: 40

***General Instructions:***

1. *The question paper consists of 14 questions divided into three sections A, B and 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. Internal choice has been provided in one question. It contains two Case Study based questions.*

### Section A

| Q. No. | | Marks |
|---|---|---|
| 1. | Find k so that the quadratic equation $(k+1)x^2 - 2(k+1)x + 1 = 0$ has equal roots. | 2 |
| 2. | Find the positive root of the equation $\sqrt{3x^2+6} = 9$<br>**(OR)**<br>If Veena were younger by 5 years than what she really is, then the square of her age would have been 11 more than five times her present age. What is her present age? | 2 |
| 3. | If seven times the 7th term of an AP is equal to eleven times the 11th term, then what will be its 18th term.<br>**(OR)**<br>If the $n$th term of an AP is given by $a_n = 5n - 3$, then find the sum of first 10 terms. | 2 |
| 4. | In the given figure, AB is the diameter of a circle O and AT is a tangent. If $\angle AOQ = 58°$, find $\angle ATQ$.   | 2 |
| 5. | Three cubes of iron whose edges are 3 cm, 4 cm and 5 cm respectively are melted and formed into a single cube, what will be the edge of the new cube formed? | 2 |
| 6. | If the median of a series exceeds the mean by 3, find by what number the mode exceeds its mean? | 2 |

## Section B

7. Draw two concentric circles of radii 2 cm and 5 cm. Take a point P on the outer circle and construct a pair of tangents PA and PB to the smaller circle. 3

8. A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60°. Find the distance between the foot of the tower and the ball. (Take $\sqrt{3} = 1.732$) 3

9. The mode of the following distribution is 36. Find the missing frequency f. 3

| Class | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 |
|---|---|---|---|---|---|---|---|
| Frequency | 8 | 10 | f | 16 | 12 | 6 | 7 |

10. Calculate the median of the following data: 3

| Marks | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 |
|---|---|---|---|---|---|
| No. of students | 5 | 15 | 30 | 8 | 2 |

**(OR)**

Find the mean of the following distribution:

| Class interval | 0 - 6 | 6 - 12 | 12 - 18 | 18 - 24 | 24 - 30 |
|---|---|---|---|---|---|
| Frequency | 5 | 4 | 1 | 6 | 4 |

## Section C

11. In a right triangle ABC, right angled at B, BC = 12 cm and AB = 5 cm. Find the radius of the circle inscribed in this triangle. 4

12. A tent is in the shape of cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m, find the cost of canvas needed to make the tent, if the canvas is available at the rate of ₹500 per square metre. 4

**(OR)**

Water is flowing at the rate of 15 km/hr through a pipe of diameter 14 cm into a cuboidal pond which is 50 m long and 44 m wide. In what time will the level of water in the pond rise by 21 cm?

13. In a plant nursery there are 23 rose plants in the first row, 21 in the second row, 19 in the third and so on. There are 5 rose plants in the last row.

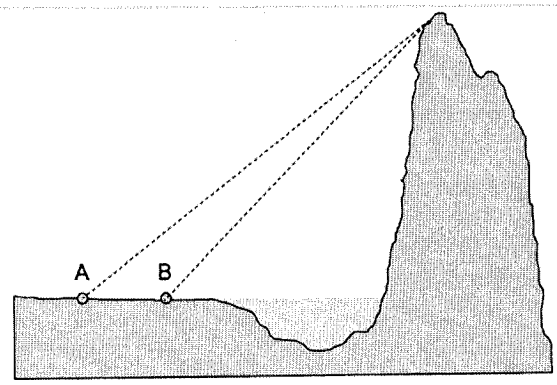
(i) How many rows of rose plants are there in the nursery? 2

(ii) What is the difference between the number of rose plants in the second row and in the $9^{th}$ row? 2

14. A team went to Nainital to survey mountains. The team members A and B were standing on the ground and wanted to find the height of the mountain some distance away from the other side of the lake. One team member was standing on the top of the mountain. The angle between the horizontal ground at A and the line of sight to the top of the mountain to be 30°. The angle between the horizontal ground at B and the line of sight to the top of the mountain be 60°. The distance between A and B is 400 m. Based on the given situation, answer the following questions.

(i) Make a labelled figure on the basis of the given information and calculate the horizontal distance from B to mountain. 3

(ii) Find the height of the mountain above the level of AB. 1




**End of the Question Paper**

| Roll Number | | |
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SET B

# INDIAN SCHOOL MUSCAT
## SECOND PRE-BOARD EXAMINATION
## MATHEMATICS (041)

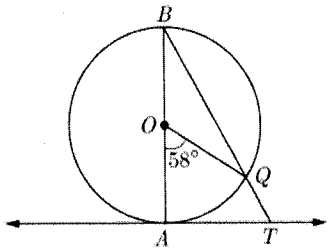
CLASS: 10 TERM II Time Allotted: 2 Hrs.

24.02.2022 Max. Marks: 40

***General Instructions:***

1. *The question paper consists of 14 questions divided into three sections A, B and 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. Internal choice has been provided in one question. It contains two Case Study based questions.*

### Section A

| Q. No. | | Marks |
|---|---|---|
| 1. | If k is a natural number, then find the largest value of k for which $x^2 - 8x + k = 0$ will have real roots. | 2 |
| 2. | Find the positive root of the equation $\sqrt{3x^2 + 6} = 9$<br>**(OR)**<br>If Veena were younger by 5 years than what she really is, then the square of her age would have been 11 more than five times her present age. What is her present age? | 2 |
| 3. | If the median of a series exceeds the mean by 3, find by what number the mode exceeds its mean? | 2 |
| 4. | In the given figure, AB is the diameter of a circle O and AT is a tangent. If $\angle AOQ = 58°$, find $\angle ATQ$.   | 2 |
| 5. | Two cubes each of volume 8 $cm^3$ are joined end to end. Then what will be the surface area of the resulting cuboid? | 2 |
| 6. | If seven times the 7th term of an AP is equal to eleven times the 11th term, then what will be its 18th term.<br>**(OR)**<br>If the $n$th term of an AP is given by $a_n = 5n - 3$, then find the sum of first 10 terms. | 2 |

## Section B

7. The mode of the following distribution is 36. Find the missing frequency f. 3

| Class | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 |
|---|---|---|---|---|---|---|---|
| Frequency | 8 | 10 | f | 16 | 12 | 6 | 7 |

8. Draw two concentric circles of radii 2 cm and 5 cm. Take a point P on the outer circle and construct a pair of tangents PA and PB to the smaller circle. 3

9. A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60°. Find the distance between the foot of the tower and the ball. (Take $\sqrt{3} = 1.732$) 3

10. Calculate the median of the following data: 3

| Marks | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 |
|---|---|---|---|---|---|
| No. of students | 5 | 15 | 30 | 8 | 2 |

**(OR)**

Find the mean of the following distribution:

| Class interval | 0 - 6 | 6 - 12 | 12 - 18 | 18 - 24 | 24 - 30 |
|---|---|---|---|---|---|
| Frequency | 5 | 4 | 1 | 6 | 4 |

## Section C

11. $\Delta ABC$ with area 84 $cm^2$ is inscribing a circle with centre O and radius 4 cm such that it sides AB, BC and CA touches the circle at P, Q and R respectively. The line segments AP and BP into which side AB is divided by the point of contact are 6 cm and 8 cm. Find the lengths of the sides AC and BC. 4

12. A tent is in the shape of cylinder surmounted by a conical top of same diameter. If the height and diameter of cylindrical part are 2.1 m and 3 m respectively and the slant height of conical part is 2.8 m, find the cost of canvas needed to make the tent, if the canvas is available at the rate of ₹500 per square metre. 4

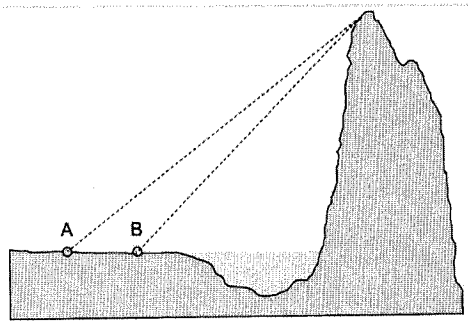
**(OR)**

Water is flowing at the rate of 15 km/hr through a pipe of diameter 14 cm into a cuboidal pond which is 50 m long and 44 m wide. In what time will the level of water in the pond rise by 21 cm?

13. A team went to Nainital to survey mountains. The team members A and B were standing on the ground and wanted to find the height of the mountain some distance away from the other side of the lake. One team member was standing on the top of the mountain. The angle between the horizontal ground at A and the line of sight to the top of the mountain to be 30°. The angle between the horizontal ground at B and the line of sight to the top of the mountain be 60°. The distance between A and B is 400 m. Based on the given situation, answer the following questions.

(i) Make a labelled figure on the basis of the given information and calculate the horizontal distance from B to mountain. 3

(i) Find the height of the mountain above the level of AB. 1




14. In a plant nursery there are 23 rose plants in the first row, 21 in the second row, 19 in the third and so on. There are 5 rose plants in the last row.

(i) How many rows of rose plants are there in the nursery? 2

(ii) What is the difference between the number of rose plants in the third row and in the $8^{th}$ row? 2

**End of the Question Paper**

| Roll Number | | |
|---|---|---|

SET C

# INDIAN SCHOOL MUSCAT
# SECOND PRE-BOARD EXAMINATION
# MATHEMATICS (041)

CLASS: X | TERM II | Time Allotted: 2 Hrs.

27.02.2022 | Max. Marks: 40

***General Instructions:***

1. *The question paper consists of 14 questions divided into three sections A, B and 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.*
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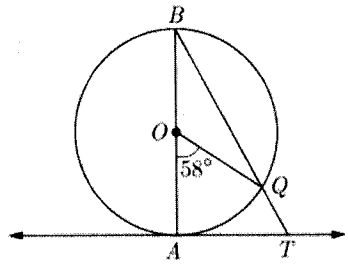
5. *Section C comprises of 4 questions of 4 marks each. Internal choice has been provided in one question. It contains two Case Study based questions.*

## Section A

| Q. No. | | Marks |
|---|---|---|
| 1. | Ajay is trying to find the values of k for which the roots of the quadratic equation $2x^2 - 4x + 3k = 0$ are real. He establishes that for k = 1 the given equation will have real roots. Justify if Ajay is right or wrong. | 2 |
| 2. | If the median of a series exceeds the mean by 3, find by what number the mode exceeds its mean? | 2 |
| 3. | If seven times the 7th term of an AP is equal to eleven times the 11th term, then what will be its 18th term.<br>**(OR)**<br>If the $n$th term of an AP is given by $a_n = 3n - 5$, then find the sum of first 10 terms. | 2 |
| 4. | In the given figure, AB is the diameter of a circle O and AT is a tangent. If $\angle AOQ = 58°$, find $\angle ATQ$.<br>  | 2 |
| 5. | Three solid metallic spherical balls of radii 3 cm, 4 cm and 5 cm are melted into a single spherical ball. Find its radius. | 2 |

6. Find the positive root of the equation $\sqrt{3x^2 + 25} = 10$ 2

**(OR)**

If Veena were younger by 5 years than what she really is, then the square of her age would have been 11 more than five times her present age. What is her present age?

## Section B

7. A player sitting on the top of a tower of height 20 m observes the angle of depression of a ball lying on the ground as 60°. Find the distance between the foot of the tower and the ball. (Take $\sqrt{3} = 1.732$) 3

8. Calculate the median of the following data: 3

| Marks | 0 - 10 | 10 - 20 | 20 - 30 | 30 - 40 | 40 - 50 |
|---|---|---|---|---|---|
| No. of students | 5 | 15 | 30 | 8 | 2 |

**(OR)**

Find the mean of the following distribution:

| Class interval | 0 - 6 | 6 - 12 | 12 - 18 | 18 - 24 | 24 - 30 |
|---|---|---|---|---|---|
| Frequency | 5 | 4 | 1 | 6 | 4 |

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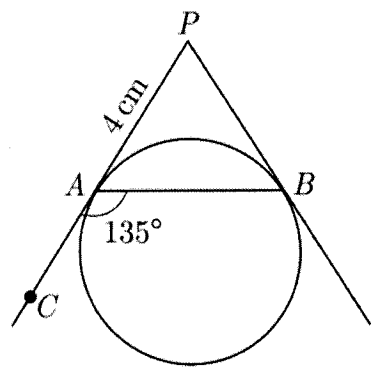
| Class | 0 - 10 | 10 – 20 | 20 – 30 | 30 - 40 | 40 - 50 | 50 - 60 | 60 - 70 |
|---|---|---|---|---|---|---|---|
| Frequency | 8 | 10 | f | 16 | 12 | 6 | 7 |

## Section C

11. In the given figure, PA and PB are tangents to a circle from an external point P such that PA = 4 cm and $\angle BAC = 135°$. Find the length of the chord AB. 4



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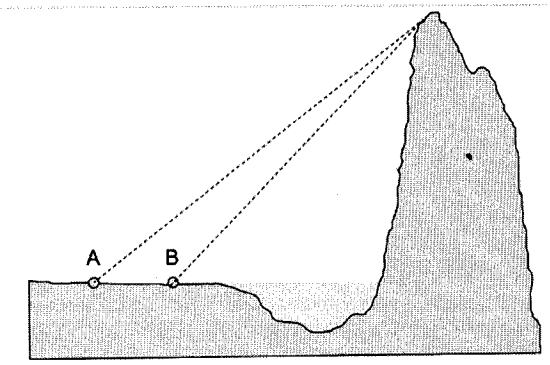


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(i) Find the height of the mountain above the level of AB. 1

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**(OR)**

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**End of the Question Paper**