

Roll Number

SET A



INDIAN SCHOOL MUSCAT
SECOND TERM EXAMINATION
MATHEMATICS (041)

CLASS: XI

Time Allotted: 2 Hrs.

21.02.2022

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 one question.
4. Section B comprises of 4 questions of 3 marks each. Internal choice has been provided in two questions.
5. Section C comprises of 4 questions of 4 marks each. Internal choice has been provided in one question. It contains one Case Study based question.

Section A

- | Q.No. | | Marks |
|-------|--|-------|
| 1. | Find the value of $\tan 15^\circ$ | (2) |
| 2. | There are 13 cricket players, out of which 4 are bowlers. In how many ways can a team of 11 be selected from them so as to include at least three bowlers? | (2) |
| 3. | Find the derivative of $\frac{x-1}{x+1}$ with respect to x .
(OR)
Find the derivative of $(3x^2 + 1)\sin x$ with respect to x . | (2) |
| 4. | Find the equation of parabola, with axis of symmetry along the X-axis and passing through the point $(-1, 4)$. | (2) |
| 5. | A card is drawn at random from a well-shuffled deck of 52 cards. Find the probability that the card is a spade or a king. | (2) |
| 6. | Find n if $n_{P_4} : n_{P_5} = 1 : 2$ | (2) |

Section B

7. Find the coordinates of the point which divides the line segment joining the points A(1, -2, 3) and B(3, 4, -5) in the ratio 2 : 3 internally. Also find the distance between the points A and B. (3)
- OR**
- Show that the three points A (2, 3, 4), B (-1, 2, -3) and C (-4, 1, -10) are collinear and find the ratio in which C divides AB.

8. If $\cos x = -\frac{12}{13}$ and $\pi < x < \frac{3\pi}{2}$, find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$. (3)

9. In how many ways can 8 books be arranged on a shelf if (3)
- any arrangement is possible
 - 3 particular books must always stand together.
 - two particular books must occupy the ends?

10. Prove that $(\cos A + \cos B)^2 + (\sin A - \sin B)^2 = 4 \cos^2 \left(\frac{A+B}{2} \right)$ (3)

(OR)

Show that $\frac{\sin 8x \cos x - \sin 6x \cos 3x}{\cos 2x \cos x - \sin 4x \sin 3x} = \tan 2x$

Section C

11. Find the derivative of the function $f(x) = (x-1)(x-2)$ from first principle. (4)

12. Find the equation of the circle passing through the point $(-1, 3)$ and having its centre at the point of intersection of the lines $x + 2y = 10$ and $2x + y = 6$. (4)

(OR)

Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of latus rectum of the ellipse $16x^2 + 25y^2 = 400$.

13. Solve the following system of inequalities graphically : (4)

$$x + y \leq 5, \quad 4x + y \geq 4, \quad x + 5y \geq 5, \quad x \geq 0, \quad y \geq 0.$$

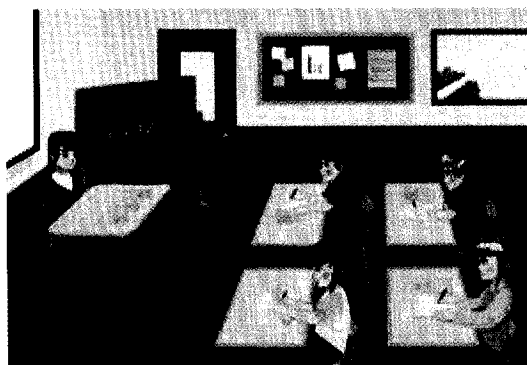
14. **CASE STUDY:**

Two students A and B appeared in an examination. The probability that A will qualify the examination is 0.25 and that B will qualify the examination is 0.45. The probability that both will qualify the examination is 0.1. (4)

Find the probability that

(i) both A and B will not qualify the examination.

(ii) only one of them will qualify the examination.



End of the Question Paper

Roll Number

SET B



INDIAN SCHOOL MUSCAT
SECOND TERM EXAMINATION
MATHEMATICS (041)

CLASS: XI

Time Allotted: 2 Hrs.

21.02.2022

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 two questions.
5. Section C comprises of 4 questions of 4 marks each. Internal choice has been provided in one question. It contains **One** Case Study based question.

Section A

Q.No.

Marks

1. Find the derivative of $\frac{x-2}{x+2}$ with respect to x . (2)
(OR)
Find the derivative of $(5x^2 + 1)\tan x$ with respect to x .
2. Find n if $n_{P_4} : n_{P_5} = 1 : 2$ (2)
3. A card is drawn at random from a well-shuffled deck of 52 cards. Find the probability that the card is a spade or a king. (2)
4. Find the value of $\tan 75^\circ$ (2)
5. Find the equation of parabola, with axis of symmetry along the X-axis and passing through the point $(-1, 4)$. (2)
6. There are 13 cricket players, out of which 4 are bowlers. In how many ways can a team of 11 be selected from them to include at least three bowlers? (2)

Section B

7. If $\cos x = -\frac{12}{13}$ and $\pi < x < \frac{3\pi}{2}$, find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$. (3)

8. Find the coordinates of the point which divides the line segment joining the points A(1, -2, 3) and B(3, 4, -5) in the ratio 2 : 3 internally. Also find the distance between the points A and B. (3)

OR

Show that the three points A (2, 3, 4), B (-1, 2, -3) and C (-4, 1, -10) are collinear and find the ratio in which C divides AB.

9. Prove that $(\cos A + \cos B)^2 + (\sin A - \sin B)^2 = 4 \cos^2 \left(\frac{A+B}{2} \right)$ (3)
- (OR)**

Show that $\frac{\sin 8x \cos x - \sin 6x \cos 3x}{\cos 2x \cos x - \sin 4x \sin 3x} = \tan 2x$

10. How many different words, with or without meaning, can be formed with the letters of the word EQUATION if (3)
- (i) the words begin with N and end with E.
 - (ii) all vowels must occur together.
 - (iii) all consonants occur together.

Section C

11. Solve the following system of inequalities graphically: (4)
- $$x + y \leq 5, \quad 4x + y \geq 4, \quad x + 5y \geq 5, \quad x \geq 0, \quad y \geq 0.$$

12. Find the equation of the circle passing through the point (-1, 3) and having its centre at the point of intersection of the lines $x + 2y = 10$ and $2x + y = 6$. (4)
- (OR)**

Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of latus rectum of the ellipse $16x^2 + 25y^2 = 400$.

13. Find the derivative of the function $f(x) = (x + 3)(x - 4)$ from first principle. (4)

14. **CASE STUDY:**

Two students A and B appeared in an examination. The probability that A will qualify the examination is 0.05 and that B will qualify the examination is 0.10. The probability that both will qualify the examination is 0.02. (4)

Find the probability that

- (i) Both A and B will not qualify the examination.
- (ii) Only one of them will qualify the examination.



End of the Question Paper

Roll Number

SET C



INDIAN SCHOOL MUSCAT SECOND TERM EXAMINATION MATHEMATICS (041)

CLASS: XI

Time Allotted: 2 Hrs.

21.02.2022

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 two questions.
5. Section C comprises of 4 questions of 4 marks each. Internal choice has been provided in one question. It contains **One** Case Study based question.

Section A

- | Q.No. | Marks |
|--|-------|
| 1. Find n if $n - 1P_3 : nP_4 = 1 : 9$ | (2) |
| 2. Find the equation of parabola, with axis of symmetry along the X-axis and passing through the point $(-1, 4)$. | (2) |
| 3. Find the value of $\sin 15^\circ$ | (2) |
| 4. There are 13 football players, out of which 4 are forwards. In how many ways can a team of 11 be selected from them to include at least three forwards? | (2) |
| 5. Find the derivative of $\frac{x-3}{x+3}$ with respect to x . | (2) |
| (OR) | |
| Find the derivative of $(3x^2 - 1) \sec x$ with respect to x . | |
| 6. A card is drawn at random from a well-shuffled deck of 52 cards. Find the probability that the card is a club or a queen. | (2) |

Section B

7. Prove that $(\cos A + \cos B)^2 + (\sin A - \sin B)^2 = 4 \cos^2 \left(\frac{A+B}{2} \right)$ (3)
- (OR)
- Show that $\frac{\sin 8x \cos x - \sin 6x \cos 3x}{\cos 2x \cos x - \sin 4x \sin 3x} = \tan 2x$

8. In how many ways can 8 books be arranged on a shelf if (3)
 (i) any arrangement is possible
 (ii) 3 particular books must always stand together.
 (iii) two particular books must occupy the ends?

9. Find the coordinates of the point which divides the line segment joining the points A(1, -2, 3) and B(3, 4, -5) in the ratio 2 : 3 internally. Also find the distance between the points A and B. (3)

OR

Show that the three points A (2, 3, 4), B (-1, 2, -3) and C (-4, 1, -10) are collinear and find the ratio in which C divides AB.

10. If $\cos x = -\frac{12}{13}$ and $\pi < x < \frac{3\pi}{2}$, find $\sin \frac{x}{2}$, $\cos \frac{x}{2}$ and $\tan \frac{x}{2}$. (3)

Section C

11. Solve the following system of inequalities graphically : (4)
 $x + y \leq 5$, $4x + y \geq 4$, $x + 5y \geq 5$, $x \geq 0$, $y \geq 0$.

12. Find the derivative of the function $f(x) = (x - 2)(x - 1)$ from first principle. (4)

13. Find the equation of the circle passing through the point (-1, 3) and having its centre at the point of intersection of the lines $x + 2y = 10$ and $2x + y = 6$. (4)

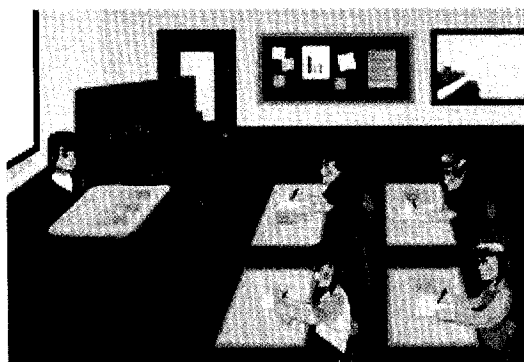
(OR)

Find the coordinates of the foci, the vertices, the length of major axis, the minor axis, the eccentricity and the length of latus rectum of the ellipse $16x^2 + 25y^2 = 400$.

14. **CASE STUDY:** (4)
 Two students A and B appeared in an examination. The probability that A will qualify the examination is 0.25 and that B will qualify the examination is 0.45. The probability that both will qualify the examination is 0.1.

Find the probability that

- (i) both A and B will not qualify the examination.
 (ii) only one of them will qualify the examination.



End of the Question Paper