MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Hons.) Horticulture

Semester	: **I (New)**	**Term**	: **I**	**Academic Year**	: **2019-20**
Course No.	: MATH 111	**Title**	: **Mathematics**		
Credits	: 2(1+1)				
Day & Date	: Tuesday, 31.12.2019	**Time**	: 14.00 to 16.00	**Total Marks**	: **40**

Note :
1. Solve **ANY EIGHT** questions from **SECTION "A"**.
2. All questions from **SECTION "B"** are compulsory.
3. All questions carry equal marks.
4. Draw neat diagrams wherever necessary.

SECTION "A"

Q.1 Evaluate (Any Two).

a) $\begin{bmatrix} 8 & -3 \\ 4 & 5 \end{bmatrix} + \begin{bmatrix} 2 & -7 \\ 6 & 4 \end{bmatrix}$

b) $\begin{bmatrix} 6 & -2 \\ -5 & 6 \end{bmatrix} - \begin{bmatrix} 3 & -7 \\ -6 & 5 \end{bmatrix}$

c) $\begin{bmatrix} -14 & 17 \\ 15 & 12 \end{bmatrix} - \begin{bmatrix} 0 & -17 \\ 13 & -11 \end{bmatrix}$

Q.2 Evaluate

a) $\begin{vmatrix} 5 & -1 \\ 3/2 & 4 \end{vmatrix}$

b) $\begin{vmatrix} 2+3i & 1 \\ 2 & 2-3i \end{vmatrix}$

Q.3 a) State the formula for angle between two intersecting lines.

b) State the condition of concurrency of lines in a plane.

Q.4 Write the general form of equation of circle. Find the equation of circle if centre of the circle is at (3, 2) and the radius is 5 unit.

Q.5 Define function. State any three different ways of representing of a function with illustration.

Q.6 Evaluate $\lim_{x \to 3} \frac{x^5 - 243}{x^2 - 9}$

Q.7 State the derivatives of any four standard functions.

Q.8 Write all possible reasons for discontinuity of a function at a point.

Q.9 State and explain Simpson's 1/3 rd rule for finding the area of the curvilinear region in a plane.

Q.10 State the formula for finding the area under curve with necessary diagram.

(P.T.O.)

SECTION "B"

Q.11 State True or False.

1) If the order of matrix A = order of matrix B and if the corresponding elements of A and B are same, then the two matrices A and B are said to be equal.

2) If elements of a row (or column) are multiplied with cofactors of any other row (or column), then sum is zero.

3) If m_1 and m_2 are the slopes of two intersecting straight lines and θ is the acute angle between them, then $\tan\theta = \left|\frac{m_1 - m_2}{1 + m_1 m_2}\right|$.

4) Diameter form of equation of circle is $(x - x_1)(x - x_2) + (y - y_1)(y - y_2) = 0$

Q.12 Fill in the blanks.

1) $\int \sin x \, dx =$ _____.

2) If two rows (or columns) of a determinant are equal, then its value is _____.

3) $\begin{bmatrix} a & b \\ c & d \\ e & f \end{bmatrix}^2$ is a _____ matrix.

4) If the two straight lines are perpendicular then the product of their slopes is _____.