MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END EXAMINATION

B.Sc. (Hons.) Horticulture

Semester	: I (New)	**Term**	: I	**Academic Year**	: 2018
Course No.	: MATH 111	**Title**	: Mathematics		
Credits	: 2(1+1)				
Day & Date	: Tuesday, 18.12.2018	**Time**	: 09.00 to 11.00	**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 Form the equation whose roots are $2+\sqrt{3}$ and $2-\sqrt{3}$

Q.2 Evaluate the determinant : $\begin{vmatrix} 5 & 10 & 15 \\ 20 & 25 & 30 \\ 35 & 40 & 45 \end{vmatrix}$

Q.3 Find the area of a field using Simpson's rule if the ordinates are 4, 7, 8, 10, 7, 6, 3 meters and common distance is 1 meter.

Q.4 Enlist any four properties of determinants.

Q.5 Find the equation to the circle having its centre at the point (2, 0) and radius 1 unit.

Q.6 Find the co-ordinates of the centre and radius of a circle whose equation is : $x^2+y^2+6x-8y=0$

Q.7 Solve the quadratic equation: $3x^2 = x+2$.

Q.8 Evaluate the following limits (Any Two).

a) $\lim_{x\to 1}\frac{x^{10}-1}{x^7-1}$ b) $\lim_{x\to 0}\frac{3x^4-5x^3+x^2}{x^2}$ c) $\lim_{x\to 0}\frac{\tan 5x}{\sin 3x}$

Q.9 Differentiate the following functions w.r.t. 'x' (Any Two).

a) $\frac{\sin x}{e^x}$ b) $(3x^2-5x+7)^{10}$ c) $\cos 5x$

Q.10 State any four rules for differentiation of functions.

SECTION "B"

Q.11 Fill in the blanks

1) A quadratic equation cannot have more than _____ roots.
2) The process of finding the derivative of a function is called _____.
3) If a function, $f(x)$ is continuous at a point $x = a$, then $\lim_{x\to a} f(x) =$_____.
4) The limit of a function if it exists is _____.

Q.12 Select the correct answer.

1) The product of roots of a quadratic equation, $ax^2+bx+c=0, a\neq 0$ *is*_____.
   a) a/b b) b/a c) c/a d) a/c
2) The roots of a quadratic equation $x^2-x-6=0$ are _____.
   a) Real and distinct b) Real and equal c) Imaginary d) None of these
3) _____ is an example of an exponential function.
   a) 2^x b) x^2 c) log d) sin x
4) $\frac{d(\sin x)}{dx} =$ _____.
   a) $\cos x$ b) $\tan x$ c) $\sec x$ d) $\sin x$

✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧ ✧