

MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE
SEMESTER END THEORY EXAMINATION

B.Sc.(Hons.) Horticulture

Semester : I (New)	Term : First	Academic Year : 2022-23
Course No. : H/MATH 111	Title : Mathematics	
Credits : 2 (1+1)		
Day & Date : Friday, 24.03.2023	Time : 15:00 to 17:00 hrs.	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 diagram wherever necessary.

SECTION 'A'

- Q.1 Find the area of a field using Simpson's rule, if the ordinates are 9, 13, 17, 20, 22, 14 and 8 m and Common distance is 2 m.
- Q.2 Prove that the sum of roots of quadratic equation $ax^2 + bx + c = 0$ is $-b/a$, where $a \neq 0$.
- Q.3 Evaluate the determinant:
$$\begin{vmatrix} 3 & 4 & 5 \\ 2 & 3 & 6 \\ 6 & 8 & 9 \end{vmatrix}$$
- Q.4 Find the co-ordinates of the centre and radius of a circle whose equation is:
 $x^2 + y^2 - 6x - 8y + 16 = 0$
- Q.5 State any four properties of determinants.
- Q.6 Define function and state different types of functions.
- Q.7 Find the equation of the circle with centre at (1, 2) and radius 5.
- Q.8 Evaluate the following limits (Any Two):
- a) $\lim_{x \rightarrow 3} \frac{x^2 - 9}{x - 3}$ b) $\lim_{x \rightarrow 0} \frac{\sin 5x}{\sin 2x}$ c) $\lim_{x \rightarrow 3} 3x^2 + x - 3$
- Q.9 Form a quadratic equation whose roots are -1 and 3.
- Q.10 Differentiate the following function w.r.t. 'x' (Any Two):
- a) $x^2 \sin x$ b) $2x^3 - 3x^2$ c) $3x^2 - 2e^x + 3 \log x$

SECTION 'B'

- Q.11 Fill in the blanks:

- 1) The roots of a quadratic equation are imaginary and unequal, if _____.
- 2) If $x^2 + y^2 = 1$, then the radius of circle (r) = _____.
- 3) $\frac{d}{dx} e^x =$ _____.
- 4) $\lim_{x \rightarrow a} x^n =$ _____.

(P.T.O.)

Q.12 State True or False:

- 1) Simpson's rule can be used to measure the area of a sphere.
- 2) Derivative of constant function is zero.
- 3) $\log x$ is an exponential function.
- 4) If any two rows or columns of the determinant are interchanged, then the value of the determinant changes by sign only.

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