MAHARASHTRA AGRICULTURAL UNIVERSITIES EXAMINATION BOARD, PUNE

SEMESTER END THEORY EXAMINATION

B.Sc.(Hons.) Agriculture/ B.Sc.(Hons.) Forestry/ B.Sc.(Hons.) A.B.M.

Semester	: 1 (New)	Term	: First	Academic Year	: 2023-24		
Course No.	: MATH 111	Title	: Elementary Mathematics				
Credits	: 2 (1+1)						
Day & Date	: Thursday, 11.01.2024	Time	: 15:00 to17:00 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 Define Matrix. Write any three types of matrices with example.

Q.2 Show that the point (3, 1) is equidistant from the points (-3, 4) and (6, 7).

Q.3 Evaluate $\begin{vmatrix} 1 & 2 & 3 \\ 4 & 5 & -6 \\ 7 & 8 & 9 \end{vmatrix}$

Q.4 Find the equation of the line passing through the point (3, 2) and having slope 2.

Q.5 Find the equation of the circle with diameter AB, where A and B are the points (-1, 2) and (3, 3), respectively.

Q.6 Find the coordinates of the point which divides the line segment joining the points A (-2, 1) and B (5, 7) internally in the ratio 2:1.

Q.7 Apply Simpson's rule to find in square feet, area of a field having the following dimensions: Ordinates: 0, 20, 32, 36, 32, 20, 0 and the common distance being 20 ft.

Q.8 Explain any four types of functions with one example each.

Q.9 Evaluate:

a) $\int (x^5 + 3x^3 + 4x + 7)\, dx$

b) $\int \frac{(x+3)(x-5)}{x}\, dx$

Q.10 Differentiate the following with respect to x (Any Two):

a) $y = \sqrt{1 + x^2}$

b) $y = 5x^7 + \sin x$

c) $y = 2x^2 + 3x + 4$

(P.T.O.)

SECTION 'B'

Q.11 Fill in the blanks:

1) If the slope of two straight lines are equal ($m_1 = m_2$), then these straight lines are _____.

2) The value of Y, which is related to the value of X, is called _____ of the function.

3) Simpson's rule can be applied only if the number of ordinates is _____.

4) The function to be integrated is called _____.

Q.12 State True or False:

1) $\lim_{x \to a} \left(\frac{x^n - a^n}{x - a}\right) = n\,a^{n-1}$.

2) X co-ordinate of every point on Y axis is zero.

3) The indefinite integral of a function is unique.

4) $\int sinx\, dx = -\cos x + C$.

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