

School of Agriculture

**Bachelor of Science Honours in Agriculture
Semester End Examination - Aug 2024**

**Duration : 180 Minutes
Max Marks : 100**

Sem I - C1UC121T/AGRI1008 - Elementary Mathematics

General Instructions

Answer to the specific question asked

Draw neat, labelled diagrams wherever necessary

Approved data hand books are allowed subject to verification by the Invigilator

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|-----|---|--------|
| 1) | If $A = \begin{bmatrix} 1 & 3 \\ 4 & 5 \end{bmatrix}$, $B = \begin{bmatrix} -1 & 2 \\ 7 & -5 \end{bmatrix}$ and $C = \begin{bmatrix} 0 & -5 \\ -11 & 0 \end{bmatrix}$, find $A + B + C$. | K1(3) |
| 2) | Find the limit of the function f given by $f(x) = 2x + 3$ at $x = 1$. | K2(4) |
| 3) | Show that the equation of the normal to the circle $x^2 + y^2 = 5$ at the point $(1, 2)$ is $y = 2x$. | K2(6) |
| 4) | A ray of light coming from the point $(1, 2)$ is reflected at a point A on the x-axis and then passes through the point $(5, 3)$. Find the coordinates of the point A. | K3(6) |
| 5) | Find the derivative of $\frac{\sin(x)}{1+x}$ by quotient of derivative. | K3(6) |
| 6) | Solve the derivative of e^x by the first principle | K3(9) |
| 7) | Find the angle bisectors between $5x + 3y + 6 = 0$ and $2x + 7y + 9 = 0$. | K3(9) |
| 8) | Find the tangent of circle $(x - 3)^2 + (y - 3)^2 = 9$ at $(0, 3)$ and $(3, 0)$. | K4(8) |
| 9) | Find out the definite integration of $\cos(2x + 4)$ for $[0, 4]$. | K4(12) |
| 10) | Find the equations of tangent and normal to the circle $x^2 + y^2 = 25$ at point $p(-3, 4)$. | K5(10) |
| 11) | Prove that the differentiation of
(i) $e^{\sin(x^n)}$ is $nx^{(n-1)}e^{(\sin(x^n))}\cos(x^n)$
(ii) $\cos(e^{\sin(x)})$ is $-\cos(x)\sin(e^{\sin(x)})e^{\sin(x)}$. | K5(15) |

OR

Prove that the definite integrals are existing finitely:

1. $\int_1^2 4x^3 - 5x^2 + 1 dx$ 2. $\int_4^5 e^x dx$ 3. $\int_0^1 xe^{x^2} dx$.

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|-----|---|--------|
| 12) | Design two matrix of order 3 whose differences is identity matrix of order 3. | K6(12) |
|-----|---|--------|

OR

Design two matrix of order 3 whose sum is identity matrix of order

K6(12)

3.