Total No. of Questions : 18

B.Sc. (Hons) Agriculture (2019 Batch)   (Sem.–1)

ELEMENTARY MATHEMATICS

Subject Code : BSAG-106-19(B)
M.Code : 76930

Time : 3 Hrs.   Max. Marks : 60

INSTRUCTIONS TO CANDIDATES :

1. **SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.**
2. **SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.**
3. **SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.**

SECTION-A

Write briefly :

1. If the angle between two lines is $\pi/4$ and slope of one of line is ½, find the slope of other line.

2. What is the condition of parallelism of lines.

3. Find the centre and radius of circle $x^2 + y^2 - 4x + 6y = 12$.

4. Find the equation of circle whose diameters are $2x - 3y + 12 = 0$ and $x + 4y - 5 = 0$ and area is 154 square units.

5. Define limit of a function

6. Find $\dfrac{dy}{dx}$ if $y = e^x \cos x$.

7. Evaluate $\int x^{6/5} dx$

8. Evaluate $\int \sec x \tan x \, dx$

9. If $\begin{vmatrix} 3 & 2 \\ x & 4 \end{vmatrix} = 0$, then find x.

10. If $A = \begin{bmatrix} 1 \\ 3 \\ 6 \end{bmatrix}$, $B = \begin{bmatrix} 2 & 4 & 5 \end{bmatrix}$, verify $(AB)' = B'A'$.

SECTION-B

11. In what ratio line joining $(-1, 1)$ and $(5, 7)$ is divided by the line $x + y = 4$?

12. Find the equation of circle passing through $(1, 0)$, $(-1,0)$ and $(0, 1)$. Find the coordinate of its centre and radius.

13. By the definition of first principle, find the derivative of e^x.

14. Using properties of determinants, prove that

$$\begin{vmatrix} a & b & c \\ b & c & a \\ c & a & b \end{vmatrix} = (a + b + c)(ab + bc + ca - a^2 - b^2 - c^2)$$

15. Integrate $\int x^2 e^x dx$.

SECTION-C

16. Show that the area of triangle is four times the area of triangle formed by joining the mid points of its sides.

17. Find the inverse of matrix A = $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$

18. Find the equation of circle passing through the points $(1, -2)$ and $(4, -3)$ and whose circle lies on the line $3x + 4y = 7$.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.