RD19BSCAG010

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B.Sc (Ag.) 1ST SEMESTER EXAMINATIONS (REGULAR),NOV/DEC 2019

EM-111

ELEMENTARY MATHEMATICS

Time : 2 Hours   Maximum : 50 Marks

SECTION A
(Answer **all** questions of Section – A)

Q.1 Fill up the Blanks with suitable and meaningful word(s): **[0.5 X 10 = 5]**

a) The slope of the line y - 2x – 5 = 0 is _____.

b)The distance between (0,0) and (1,2) is _____.

c) If a line makes an angle 45^0 with x-axis then slope is ____.

d) The transpose of the matrix A $=\begin{pmatrix} 4 & 3 \\ 3 & -1 \end{pmatrix}$ is _____.

e) The derivative of y= cot 2x is_____.

f) The area of the square with side a   is _____.

g)The angle between two lines is_____.

h) If y= sin^{-1} x then $\frac{dy}{dx} =$_____.

i) The value of $\int \sin x \, dx$ is_____.

j) The order of a matrix A= (1 3   5) is _____.

Q.2. Define or Explain the following in one or two sentences   **[5 × 1 = 5]**

a) slope of a line   b) Transpose of a matrix c) inverse of a matrix d) Differentiation e) circle

Q.3. Match the following   **[10 × 0.5 = 5]**

A	B
(i) Slopes are equal	(a) perpendicular line
(ii) If y =a^x	(b) Collinear
(iii) Area of a triangle is zero	(c) two lines are parallel
(iv) If m$_1$ * m$_2$ =-1	(d) – sin x
(v) Singular matrix	(e) Symmetric matrix
(vi) Inverse of a matrix can be obtained if	(f) πr^2
(vii) $\int \cos x \, dx$	(g) $\frac{dy}{dx} = a^x \log a$

(viii) The derivative of cos x is   (h) det(A) = 0

(ix)   Area of a circle is   (i) $|A| \neq 0$

(x)   A matrix satisfies $A = A^T$ then   (j) sin x

Q.4. Write**TRUE** or **FALSE** against the following statements   **[10 × 0.5 = 5]**

     (a) The equation x =k represents a line parallel to x – axis. (T/F)

     (b) The line y+x+1= 0 makes an angle 45^0 with Y- axis. (T/F)

     (c) If the first and second rows of a determinant be interchanged the sign of the determinant
        is changed. (T/F)

     (d) The sum of a 3 x 4 matrix with a 3 x 4 matrix is a 6 x 8 matrix. (T/F)

     (e) The unit matrix is its own transpose. (T/F)

     (f) The value of $\int_1^5 3 \, dt$ is 4 . (T/F)

     (g) The centre of the circle $x^2 + y^2+ 2x = 0$ is (0,2) . (T/F)

     (h) The derivative of any constant is is 0 . (T/F)

     (i) The two lines y = 2x - 6 and y -2x = 5 are parallel. (T/F)

     (j) Integration is called antiderivative. (T/F)

SECTION – B: (Short Answer Questions)
(Attempt any **five** questions. Each question carries equal marks)   **[5 x 6 =30]**

5.   Differentiation of y = sin x by first principle method .

6.   Find the inverse of the matrix $A = \begin{pmatrix} 1 & 2 \\ 3 & 1 \end{pmatrix}$

7.   If x+y+z=0, show that $\begin{vmatrix} 1 & 1 & 1 \\ x & y & z \\ x^3 & y^3 & z^3 \end{vmatrix} = 0$

8.   Evaluate $\int \sin^2 2x \, dx$

9.   Fine the product of the matrices $A = \begin{pmatrix} 1 & 2 & 4 \\ 3 & 5 & 6 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 1 \\ 3 & 5 \\ 4 & 3 \end{pmatrix}$

10. Find $\frac{dy}{dx}$, if $y = \log x^2 + 3^x + \sin 4x + x^7$