Reg. No. : | | | | | | | | | | | | |

Question Paper Code : 90333

B.E./B.Tech. DEGREE EXAMINATIONS, NOVEMBER/DECEMBER 2019

Second Semester

Civil Engineering

MA 8251 : ENGINEERING MATHEMATICS – II

[Common to all branches (Except Marine Engineering)]

(Regulations 2017)

Time : Three Hours | Maximum : 100 Marks

Answer ALL questions.

PART – A **(10×2=20 Marks)**

1. Prove that any square matrix A and its transpose have the same eigen values.

2. If $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$, then find $2A^2 - 8A - 10I$, where I is the unit matrix.

3. In what direction from (2, 1, –1) is the directional derivative of $\phi(x, y, z) = x^2 y^2 z^4$ maximum ?

4. State Green's theorem in a plane.

5. Show that the function $f(z) = z\bar{z}$ is nowhere analytic.

6. Find the fixed point(s) of the bilinear transformation $w = \frac{1}{z}$.

7. Evaluate the integral $\int \frac{1}{z^2} dz$ over the entire complex plane.

8. Identify the type of the singularity for the function $f(z) = \frac{\cos z}{z}$ at the point $z = 0$,

9. Find L[t sin at].

10. State sufficiency conditions for the existence of Laplace transform.