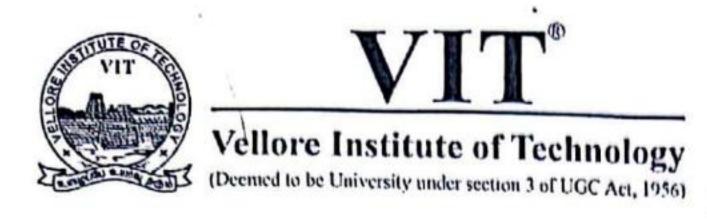
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Winter 2019 - 20

Continuous Assessment - II

Programme Name & Branch: B.Tech & All

Course (Code): CVPDE (MAT3003)

Slot: A1+TA1

Examination Duration: 90 minutes

Maximum Marks: 50

Examination Type: CLOSED BOOK

Answer any FIVE Questions ($5 \times 10 = 50$)

- Q1. a) Find the poles and the residues at each pole of $f(z) = 1/(z^2e^z)$. [5]
 - b) Identify the singularities of $f(z) = \frac{\cos \pi z^2 + \sin \pi z^2}{(z-1)^2(z-2)}$ inside the circle C: |z| = 3 and hence evaluate $\int_C f(z) dz$ by Cauchy's integral formula.
- Q2. Evaluate $\int_0^{2\pi} \frac{d\theta}{(5-3\cos\theta)^2}$ using residue theorem. [10]
- Q3. Evaluate $\int_0^\infty \frac{\sin mx}{x} dx$, when m > 0, using Cauchy's residue the- [10] orem.
- Q4. a) Eliminate the arbitrary function and derive a partial differential [5] equation from the relations $f(x + y + z, x^2 + y^2 + z^2) = 0$.
 - b) Eliminate the arbitrary constants a and b from the relations z = [5] $(x-a)^2 + (y-b)^2 + 1$ to form the partial differential equation.
- Q5. Solve the equation $xp yq = y^2 x^2$. [10]
- Q6. Solve the following equations: [10]
 - a) py + qx + pq = 0,
 - b) z = px + qy + pq.