SRM INSTITUTE OF SCIENCE AND TECHNOLOGY
DEPARTMENT OF MATHEMATICS
18MAB101T-CALCULUS AND LINEAR ALGEBRA
ASSSIGNMENT-II (UNIT-II & III) MARKS: 5*12=60

DATE 29/10/2021

1. Solve $x^2\frac{d^2y}{dx^2}+x\frac{dy}{dx}+y=\log x\sin(\log x)$.
2. Solve by the method of variation of parameters, $\frac{d^2y}{dx^2}-y=\frac{2}{1+e^x}$.
3. Expand $\tan^{-1}\left(\frac{y}{x}\right)$ about $(1,1)$ upto second-degree term using Taylor's theorem.
4. If $g(x,y)=\psi(u,v)$, where $u=x^2-y^2$ and $v=2xy$ then prove that $\frac{\partial^2 g}{\partial x^2}+\frac{\partial^2 g}{\partial y^2}=4(x^2+y^2)\left(\frac{\partial^2\psi}{\partial u^2}+\frac{\partial^2\psi}{\partial v^2}\right)$.
5. Find the shortest and longest distance between from the point $(1,2,-1)$ to the sphere $x^2+y^2+z^2=24$, using Lagrange's method of constrained maxima and minima.