PES UNIVERSITY

Electronic City Campus, Bangalore.

Program: B.Tech Batch: 2018-2019

Year/Sem: First/ I Branch: CSE/EC/ME

Maxima Lab Problems:

1. Find the 24th derivative of y = $e^{3x}\cos^2(x)\sin x$.
2. Find the angle of intersection of the curves r=sinθ+cosθ and r=2sinθ.
3. Find the radius of curvature at the origin for $y^2 = x^2\left(\frac{3+x}{3-x}\right)$.
4. Show that the function $z = e^{(x^2-y^2)}$ cos(2xy) satisfies the Laplace equation $\frac{\partial^2 z}{\partial x^2} + \frac{\partial^2 z}{\partial y^2} = 0$.
5. If $u = \frac{x}{y}cos\left(\frac{x}{y}\right)$, verify Eulers theorem
6. If u=xy/z,v=yz/x,w= zx/y , Show that J=4.
7. A) Find the Taylor's expansion of e^xcosy about the point x=1, y = π/4.
   B) Find the Maclaurin's Series expansion of $e^x log(1+y)$upto the first six terms.
8. Evaluate $\int_0^5 \int_0^{x^2} x(x^2+y^2)dxdy$.
9. Evaluate $\int_0^{\pi/2} sin^7 x\, cos^{13} x\, dx$.
10. Evaluate the following integral by changing the order of integration $\int_0^3 \int_1^{\sqrt{4-y}} (x+y)\, dxdy$.
11. Evaluate $\int_0^{1-x} \int_{y^2}^1 \int_0^1 x\, dxdydz$
12. Find the volume bounded by the cylinder $x^2+y^2=4$ and the planes y+z=4, z=0.
13. Solve the differential equation $(x^2-1)\frac{dy}{dx} + 2xy = 1$.
14. Trace the curve $y^2(4-x)=x^3$.
15. Trace the curve r= sin(3θ).