PES University, Bangalore
(Established under Karnataka Act 16 of 2014)
B.Tech – END SEMESTER ASSESSMENT - December 2017
Engineering Mathematics-I(for lateral entry students)

UE17MA101D

Time: 2 Hours Answer all Questions **Max. Marks:60**

1.	a.	Define Cauchy's Mean value theorem.	2
	b.	Find the angle between the radius vector and the tangent for the polar curve $r^m=a^m(cosm\theta+sinm\theta)$.	5
	c.	Find the n^{th} derivate of $x^3 4^x$.	5
2.	a.	If $u=\log\left(\frac{x^2+y^2}{x+y}\right)$ then find $x\frac{\partial u}{\partial x}+y\frac{\partial u}{\partial y}$.	4
	b.	If $u=x^2+y^2+z^2$ where $x=e^{2t};y=e^{2t}cost;z=e^{2t}sint$. Find $\frac{du}{dt}$ using total derivative rule.	4
	c.	Find the Reduction formula for $\sin^n(x)$.	4
3.	a.	Trace the curve $y^2(a-x)=x^2(a+x), a>0$.	6
	b.	Determine the area bounded by the curves xy=2, $4y=x^2$ and y=4.	6
4.	a.	Define Homogeneous Differential Equation.	2
	b.	Solve $(4xy+3y^2-x)dx+x(x+2y)dy=0$	4
	c.	Solve $\frac{dy}{dx}+\frac{y}{x}=y^2x$.	6
5	a.	Solve $\frac{d^2y}{dx^2}-3\frac{dy}{dx}+2y=0$; where y(0)=-1 and y'(0)=0.	5
	b.	Solve $x^2\frac{d^2y}{dx^2}-3x\frac{dy}{dx}+5y=x^2$.	7