Question Bank

Department: **Semester: I** **Academic Year: 2024 - 2025**

Class: F.Y.B.Tech. **Div:** **Date:**

Course: Engineering Mathematics I

Unit V – Application of Partial Differentiation

Q. No.	Question	Marks	CO	Blooms Level
Q.1	If $x = uv, y = \frac{u+v}{u-v}$ then find $\frac{\partial(u,v)}{\partial(x,y)}$.	5	CO5	2
Q.2	Discuss maxima and minima of $f(x,y) = x^2 + y^2 + 6x + 12$	5	CO5	2
Q.3	In calculating the volume of a right circular cone, errors of 2% and 1% are made in measuring the height and radius of base respectively and find the error in the calculated volume of the cone.	5	CO5	2
Q.4	Examine whether $u = \frac{x+y}{1-xy}, v = tan^{-1}x + tan^{-1}y$ If dependent, if so, find the relation between them.	5	CO5	2
Q.5	Find the extreme values of $x^2 + y^2 + \frac{2}{x} + \frac{2}{y}$	5	CO5	2
Q.6	If $u = x + y^2, v = y + z^2, w = z + x^2$, using Jacobians find $\frac{\partial x}{\partial u}$.	5	CO5	2
Q.7	A power dissipated in a resistor is given by $P = \frac{E^2}{R}$. If errors of 3% and 2% are found in E and R respectively, find the percentage error in P.	5	CO5	2
Q.8	Using Lagrange's method find extreme value of xyz if $x + y + z = a$.	5	CO5	2
Q.9	If $x = u + v^2, y = v + w^2, z = w + u^2$,using Jacobian find $\frac{\partial(u,v,w)}{\partial(x,y,z)}$	5	CO5	2
Q.10	If $x = u + v, y = v^2 + w^2, z = u^3 + w^3$ then find $\frac{\partial u}{\partial x}$.	5	CO5	2
Q.11	Discuss the maxima and minima of $f(x,y) = x^2 + y^2 + xy + x - 4y + 5$.	5	CO5	2
Q.12	Examine whether $u = \frac{x-y}{1+xy}, v = tan^{-1}x - tan^{-1}y$ dependent, if so, find the relation between them.	5	CO5	2

Course Faculty