

PDII-Exercise 10/05

Name : _____ SID : _____

A 、 Computations : (Total 100%, Show all your work, NO DETAIL WORK, NO POINTS!!)

1. Find the area of the surface resulting by rotating the arc of the parabola $y = x^2$ from (1,1) to (2,4) about the y-axis. (15%)	2. Find the area of the surface resulting by rotating the arc of the curve $y = \sqrt{4 - x^2}$, $-1 \leq x \leq 1$, about the x-axis. (15%)
3. Find the arc length of the curve $y^2 = 4(x + 4)^3$, $0 \leq x \leq 2$, $y > 0$. (10%)	4. Find a vector equation and parametric equations for the line segment that joins the points $P(1,0,1)$ and $Q(2,3,1)$. (10%)
5. Find the arc length of the circular helix with vector equation $\mathbf{r}(t) = \cos t \mathbf{i} + \sin t \mathbf{j} + t \mathbf{k}$ from the point (1,0,0) to the point (1, 0, 2π). (10%)	6. Find the slope of the tangent line to the curve of the cardioid $r = 1 + \sin \theta$ when $\theta = \pi/3$ (10%) [Hint: $x = r \cos \theta$, $y = r \sin \theta$]