

Please write your answer in this answer sheet and submit electronically to engr233.x@gmail.com

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Write your answers to the exam questions below			
1.a) $\phi(x,y,z) = xy^2 \sin(z) - xz$		7.b) $r'(t) = \langle 2t, 3t^2 - 1, 2t - 2 \rangle$. Hence, $Velocity = \langle 2, 2, 0 \rangle$	
1.b) $-\frac{\pi}{16} + \frac{1}{32}$		7c) $k = 0.4330127020$. Hence, $radius = \frac{1}{k} = 2.3094$	
2.		8.a) $dS = \sqrt{\frac{2x^2+2y^2}{x^2+y^2}} dx dy$	
3.a) $z = -\frac{3}{2}x + \frac{5}{2}y + 3$		8.b) $\frac{\sqrt{2}}{6}$	
3b) $Curl F = \langle 0, 0, -2 \rangle$		9.a) $\int_0^{\frac{\pi}{4}} \int_1^2 r^3 \cos(\theta) \sin(\theta) dr d\theta$ Range of the radius = 1 to 2	
3 c) $\iint_R 0 dx dy = 0$		9.b) $\frac{15}{16}$	
4.a) $\arccos\left(-\frac{1}{2}\right) = \frac{\pi}{3}$		10.a) $Div F = -2$	
4.b) $Distance = 0$		10 b) $\int_0^{\sqrt{3y}} \int_x^{\sqrt{16-x^2}} \int_1^5 2z dz dy dx = 28$	

<p>5.a)</p> $-\int_{\frac{\pi}{4}}^{\pi} \int_0^8 \cos(\theta) r^2 dr d\theta.$ <p>Range of theta = $\frac{\pi}{4}$ to π</p>	11
5.b) $\frac{256\sqrt{2}}{3}$	12.a) x-coordinate = ∞
6. a) $\frac{1}{x^2+y^2+z^2} = \frac{1}{2^2+0+0} = \frac{1}{4}$	<p>12b) $K(max) = (1.4953, 0.4730)$</p> <p>x-coordinate = 1.4953</p>
6. b) $\frac{-6\sqrt{11}}{1331}$	13.a) $Div F = 1$
6. c) $Max = \nabla f = \frac{\sqrt{22}}{242}$	13.b)
<p>7.a) When $z = 0 \rightarrow$ it passes through xy plane at</p> <p>$P = (1, 0, 0)$</p>	14. $\frac{5t^6}{6} = -152.5471$