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EE214000 Electromagnetics, Fall 2020

Your name: _____ ID: _____ Sep. 29, 2020

EE214000 Electromagnetics, Fall, 2020
Quiz #4-1, Open books, notes (26 points), due 11 pm, Wednesday, Sep. 30th, 2020
(email solutions to 劉峰麒 alex851225@gmail.com)

Late submission won't be accepted!

1. What is the physical meaning of the gradient of a scalar? (3 point)

2. What is the physical meaning of the divergence of a vector? (3 points)

3. What is the physical meaning of the curl of a vector? (3 points)

4. Verbally describe the meaning of the Stokes theorem? (3 points)

5. Verbally describe the meaning of the divergence theorem? (3 points)

6. In the Cartesian coordinate system, what are the mathematic expressions of $\nabla V, \nabla \times \vec{A}, \nabla \cdot \vec{B}, \nabla^2 V, \nabla^2 \vec{A}$? (5 points) *Please get familiar with the expressions, because you will be using them quite often in this class.

7. Explain intuitively why the two null identities:

$\nabla \times (\nabla V) = 0$ and $\nabla \cdot (\nabla \times \vec{A}) = 0$. (3+3 points)

- Note that proof of the two null identities needs some mathematically skills. As an engineer, you should at least remember the two expression from some intuitive arguments.