# Assignment # 1

**MTH622 (Spring 2018)**

**Total marks: 30**
**Module # 1 to 40**
**Due date: May 21, 2018**

## DON'T MISS THESE *Important instructions:*

- Upload assignments properly through LMS.
- All students are directed to use the font and style of text as is used in this document.
- This is an individual assignment, not group assignment, so keep in mind that you are supposed to submit **your own and self-made** assignment even if you discuss the questions with your class fellows. All similar assignments (even with some meaningless modifications) will be awarded zero marks and no excuse will be accepted**. This is your responsibility to keep your assignment safe from others**.
- Solve the assignment on MS word document.

**Question # 1.** Find the directional derivative of $\varphi = 3x^2yz^3 - 2xy^2z^2$ *at* $(1,2,1)$ in the direction $\hat{i} - 2\hat{j} + 2\hat{k}$ .

**Question # 2.**

Find constants $a, b, c$ so that $\vec{A} = (x + 2y + 2az)\hat{\imath} + (bx + y + 3z)\hat{\jmath} + (2x + cy + z)\hat{k}$

is irrotational.

**Question # 3**. Find the total work done in moving a particle in a force field given by $F = 2xz\hat{i} + yz\hat{j} + z\hat{k}$ along the curve $x = t + 1, y = 3t, z = t^2$ from $t = 0$ *to* $t = 2$ .