Set-A **AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Department: Arts and Sciences

Program: B. Sc in Computer Science and Engineering

Exam Name: Quiz#2 (Section B) **Semester: Fall, 21**

Year: 2nd **Semester: 2nd**

Course Number: Math 2203 **Course Name: Mathematics IV**

Total Marks: 20 **Time: 25 Minutes**

Answer all the following questions:		**Marks**
1.	Define directional derivative. Find out the values of *a*, *b*, *c* so that $\vec{A} = (x + y + az)\,\hat{\imath} + (bx + 3y - z)\,\hat{\jmath} + (3x + cy + z)\,\hat{k}$ is irrotational. Hence find the scalar potential function φ, such that $\vec{A} = \nabla\varphi$.	10
2.	Define closed curve with example. Evaluate $\int_c \vec{F}.\overrightarrow{dr}$ where *C* is the curve in the *xy*-plane, $y = x^3$, from (1, 1) to (2, 8) and $\vec{F} = (5xy - 6x^2)\hat{\imath} + (2y - 4x)\,\hat{\jmath}$.	10

Set-B **AHSANULLAH UNIVERSITY OF SCIENCE AND TECHNOLOGY**

Department: Arts and Sciences

Program: B. Sc in Computer Science and Engineering

Exam Name: Quiz#2 (Section B) **Semester: Fall, 21**

Year: 2nd **Semester: 2nd**

Course Number: Math 2203 **Course Name: Mathematics IV**

Total Marks: 20 **Time: 25 Minutes**

Answer all the following questions:		**Marks**
1.	Define Gradient. Find out the values of *a*, *b*, *c* so that $\vec{A} = (x + 2y + az)\,\hat{\imath} + (bx - 3y - z)\,\hat{\jmath} + (4x + cy + 2z)\,\hat{k}$ is irrotational. Hence find the scalar potential function φ, such that $\vec{A} = \nabla\varphi$.	10
2.	Define total differential. Evaluate $\int_c \vec{F}.\overrightarrow{dr}$ along the straight line joining (0, 0, 0) and (1, 2, 3) where $\vec{F} = (2y^2 + 3)\hat{\imath} + yz\hat{\jmath} + (xy - z)\hat{k}$.	10