Bahria University
Discovering Knowledge

Multivariable Calculus

BSCS Semester III

Department of Computer Science
Bahria University, Lahore Campus

Assignment:3

Deadline: Week 10, 23 May 2023

Evaluation of CLO	**Question Number**	**Marks**	**Obtained Marks**
CLO2: CLO statement Apply the knowledge of different transforms to solve relevant problems.	4	20	
CLO3: CLO statement Analyze the given problems and apply integrals to compute physical quantities like area/volume.	1,2,3	10+10+10=30	
Marks	**Total**	**50**	

Question#1 Evaluate the integral $\int_C \vec{F} \cdot d\vec{r}$, where C is a circle $x^2 + y^2 = 9$ in the $xy - plane$ (z = 0) and $\vec{F} = (2x - y + z)\boldsymbol{i} + (x + y - z^2)\boldsymbol{j} + (3x - 2y + 4z)\boldsymbol{k}$.

Question 2. If $\vec{F} = 2y\boldsymbol{i} - z\boldsymbol{j} + x^2\boldsymbol{k}$ and S is the surface of the parabolic cylinder $y = 8x^2$ in the first octant bounded by the planes y=4 and z=6, evaluate the integral $\iint_S \vec{F} \cdot \vec{n}\, dS$.

Question#3 Verify green's theorem $\oint_C (3x^2 - 8y^2)dx + (4y - 6xy)dy$, where a C is the boundary of the region bounded by $x = 0, y = 0, x + y = 1$.

Question#4 Evaluate the following

a) $L\{\sin^4 4t\}$
b) $L\{5\, sin2t\, cos2t + cos5t\}$
c) $L\{(3 + 3t)^3\}$
d) $L\{e^{-3t}cosh3t + e^{2t}sinh2t\}$