BUDDHA INSTITUTE OF TECHNOLOGY, GIDA, GORAKHPUR
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
CLASS TEST-1 (EVEN SEMESTER 2022-23)
April-2023

Course: B.Tech **Semester: 6**

Subject: Antenna & Wave Propagation **Subject Code: KEC-603**

M.M.: 30 **Time: 2:00 hrs** **Roll No._____**

SECTION-A

1. Attempt all questions. Each questions carry equal marks. **Marks: 5*1=5**

Q. No.	Question	Level of Taxonomy	Course Outcome
a.	Express the point in cylindrical and spherical coordinates: P(1,-4,2)	L2	(CO1)
b.	Express the value of differential length and area in cylindrical coordinate.	L2	(CO1)
c.	Find the gradient of scalar field: $Y = \rho^2 z\cos 2\varphi$	L3	(CO1)
d.	Define the Stokes theorem.	L2	(CO1)
e.	State the Gauss's law and derive the related Maxwell equation.	L2	(CO2)

SECTION-B

2. Attempt all questions. Each questions carry equal marks. **Marks: 3*5= 15**

Q. No.	Question	Level of Taxonomy	Course Outcome
a.	Transform a vector A= y $\widehat{a_x}$- x $\widehat{a_y}$+ z $\widehat{a_z}$ into cylindrical Coordinates. **OR**	L3	(CO1)
a.	Find constant a, b and c so that V= (x+2y+az) $\widehat{a_x}$ + (bx-3y-z) $\widehat{a_y}$ + (4x+cy+2z) $\widehat{a_z}$ is irrotational.	L3	(CO1)
b.	Discuss curl, divergence and gradient in different co-ordinates System. **OR**	L3	(CO1)
b.	Give the physical interpretation of divergence and curl of Vector.	L3	(CO1)
c.	A circular ring of radius a carries a uniform charge ρ_L C/m and is placed on the xy-plane with axis the same as the z-axis. Show that	L3	(CO2)

	$E(0,0,h)=\frac{\rho_L ah}{2\varepsilon_0\left(h^2+a^2\right)^{\frac{3}{2}}}a_Z$		

SECTION-C

3. Attempt any all questions. Each questions carry equal marks. **Marks: 2*5=10**

Q. No.	Question	Level of Taxonomy	Course Outcome
a.	Given vector field $\vec{G}=8sin\phi\,\widehat{a_r}$ in spherical coordinate. Transform it into cylindrical coordinate. **OR**	L3	(CO1)
a.	Find the divergence and curl of the vector field: $\vec{V}=\rho^2 z\widehat{a_\rho}+\rho^3\widehat{a_\phi}+3\rho z^2\widehat{a_z}$	L3	(CO1)
b.	Given that $\vec{D}=z\rho\cos^2\phi\,\widehat{a_z}\ C/m^2$, calculate the charge density at $(1,\pi/4,3)$ and the total charge enclosed by the cylinder of radius 1m with $-2\leq z\leq 2m$.	L3	(CO2)

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Note: Revised Bloom's Taxonomy Levels-

L1->Remembering, L2->Understanding, L3->Applying, L4->Analyzing, L5->Evaluating, L6-> Creating.