Enrollment No: _____ Exam Seat No:_____

C. U. SHAH UNIVERSITY

Summer Examination-2022

Subject Name : Electromagnetics

Subject Code : 4TE06ELM1 **Branch: B.Tech (Electrical)**

Semester: 6 **Date: 02/05/2022** **Time: 02:30 To 05:30** **Marks: 70**

Instructions:

(1) Use of Programmable calculator & any other electronic instrument is prohibited.
(2) Instructions written on main answer book are strictly to be obeyed.
(3) Draw neat diagrams and figures (if necessary) at right places.
(4) Assume suitable data if needed.

Q-1 **Attempt the following questions:** **(14)**

a) The close integral of D.ds is equal to (a) 0 (b) (c) E (d) Q
b) The normal component of electric flux density is continuous across the boundary. (True/False)
c) Divergence of electric flux density is equal to volume charge density. (True/False)
d) The Engineering Electromagnetics finds its application in Simulation software. (True/False)
e) The current is _____ quantity.
(a)Scalar (b)Vector. (c) Dimensionless. (d) None of the above
f) The conductors can be described with isotropic property in every direction.(True/False)
g) The integral of current density over a surface is equal to_____.
(a) Current (b) Voltage (c) Power (d) None of the above
h) The integral of electric flux density over a close surface is equal to charge enclosed. (True/False)
i) The divergence of electric flux density is equal to ___.
(a) Q (b) E (c) charge density (d) None of the above
j) The velocity is _____ quantity. (a) Scalar (b) Dimensionless (c) Vector (d) None of the above.

k) If vector A and vector B are perpendicular to each other the dot product will be (a) 0 (b) 1 (c) equal to product of their magnitude (d) None of the above
l) If vector A and vector B are perpendicular to each other the cross product will be (a) 0 (b) 1 (c) equal to product of their magnitude (d) None of the above
m) Describe the procedure to find the unit vector from given vector.
n) State any three uses of electromagnetics.

Attempt any four questions from Q-2 to Q-8

Q-2		**Attempt all questions**	**(14)**
	(a)	Briefly describe Cartesian co-ordinate system. Draw various sketches.	**(7)**
	(b)	Draw the various sketches of cylindrical co-ordinate system.	**(7)**
Q-3		**Attempt all questions**	**(14)**
	(a)	If $\mathbf{A}=3\mathbf{ax}+5\mathbf{ay}-\mathbf{a_z}$, $\mathbf{B}= 2\mathbf{a_x} -3\mathbf{a_y}-\mathbf{a_z}$ then find **AxB**.	**(7)**
	(a)	If $\mathbf{F}=5\mathbf{a_x}-2\mathbf{ay}+4\mathbf{az}$ find the magnitude and direction of unit vector $\mathbf{a_G}$	**(7)**
Q-4		**Attempt all questions**	**(14)**
	(a)	State the formulae of dot product and cross product and state any two physical example of each.	**(7)**
	(b)	Write the table on dot product of unit vectors in cylindrical and Cartesian co-ordinate system. Briefly describe the process with sketches.	**(7)**
Q-5		**Attempt all questions**	**(14)**
	(a)	Explain the vector form of Coulomb's law in Cartesian co-ordinate system.	**(7)**
	(b)	Explain the point form of Gauss's law in Cartesian vector space.	**(7)**
Q-6		**Attempt all questions**	**(14)**
	(a)	Draw the various sketches of streamlines in fields.	**(7)**
	(b)	Derive the Poisson's equation and Laplace equation for Cartesian co-ordinate system.	**(7)**
Q-7		Attempt all questions	**(14)**
	(a)	What is curl? Derive the curl equation for magnetic field intensity in Cartesian co-ordinate system.	**(7)**
	(b)	State and explain Stoke's Theorem in vector form.	**(7)**
Q-8		**Attempt all questions**	**(14)**
	(a)	State and explain Maxwell's equation for steady magnetic field.	**(7)**
	(b)	State and explain boundary condition for magnetic field.	**(7)**