	ADAMAS UNIVERSITY		
	END-SEMESTER EXAMINATION : MAY 2021		
	(Academic Session: 2020 – 21)		
Name of the Program:	B.Tech	**Semester:**	VI
Paper Title :	Elective III (Electromagnetic Field Theory)	**Paper Code:**	EEE43116
Maximum Marks :	40	**Time duration:**	3 Hrs.
Total No of questions:	8	**Total No of Pages:**	2
(Any other information for the student may be mentioned here)	**1.** At top sheet, clearly mention Name, Univ. Roll No., Enrolment No., Paper Name & Code, Date of Exam. **2.** All parts of a Question should be answered consecutively. Each Answer should start from a fresh page. **3.** Assumptions made if any, should be stated clearly at the beginning of your answer.		

Answer all the Groups
Group A
Answer all the questions of the following $5 \times 1 = 5$

1.   a) What is 'Gradient' of a scalar?
b) What is the limitation of Ampere's circuital law?
c) The operator 'Del'(∇) is a 'Vector space function'- Justify
d) What are the transmission line parameters?
e) Distinguish between potential difference and electromotive force (emf).

GROUP –B
Answer *any three* of the following $3 \times 5 = 15$

2.   Given a vector function A= (X + C1Z) ax + (C2X – 3Z) ay + (X + C3Y + C4Z) az
(a) Calculate the value of constants C1, C2 and C3 if A is irrotational.
(b) Determine the constant C4 if A is also solenoidal.
(c) Determine the scalar potential function 'V', whose negative gradient equals A.
                                                                            [2+1+2]

3.   (a) What is Displacement Current?

(b) Prove that Displacement Current Density $(J_d) = \frac{\partial D}{\partial t}$ [2+3]

4.   (a) Define the following:
(i) Electric Field Intensity (ii) Line Charge Density (iii) Surface Charge Density
(iv) Volume Charge Density.   [1+1+1+1+1]

(b) "Current is not a vector" Justify.   [1]

5.   Draw and justify the equivalent circuit of a real resistor.   [5]

GROUP –C
Answer *any two* of the following $2 \times 10 = 20$

6. (a) What is quarter wave transformer?
(b) State and explain Faraday's law both in integral and differential form as used in time varying field.   [3+7]

7. (a) What is the physical interpretation of curl of a vector?
(b) Prove that divergence of a curl is a null scalar.   [5+5]

8. (a) What is the physical interpretation of continuity equation?
(b) Prove that the normal component of magnetic flux density (**B**) is continuous at boundary surface.   [3+7]

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