ADAMAS UNIVERSITY PURSUE EXCELLENCE	**ADAMAS UNIVERSITY** **END-SEMESTER EXAMINATION : JANUARY 2021** (Academic Session: 2020 – 21)		
Name of the Program:	B.Tech	**Semester:**	III
Paper Title :	Electromagnetic Fields	**Paper Code:**	EEC42107
Maximum Marks :	40	**Time duration:**	3 Hrs
Total No of questions:	8	**Total No of Pages:**	1

Instruction for the Candidate:

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) "Magnetic monople does not exist."- Justify this statement.
b) "Del is a scalar operator". True or False?
c) For **A** = (1, 3, 4) and **B** = (1, 0, 2), find **A**.**B**.
d) When does the characteristic impedance of a transmission line becomes a real quantity?
e) Define Electric Flux Density.

GROUP –B

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

2. A charge of $Q_1 = -1.0\ mC$ is placed at the origin of a rectangular coordinate system and a second charge, $Q_2 = -10\ mC$ is placed on the *x*-axis at a distance of *50 cm* from the origin. Find the force on Q_1 due to Q_2 if they are in free space. [5]

3. Explain Biot-Savart Law. [5]

4. Define curl of a vector. Given a vector, $\mathbf{A} = 3x\mathbf{a_x}+y\mathbf{a_y}+5z\mathbf{a_z}$, find the curl of **A**. [1+4]

5. Find out the values of propagation constant (γ) and characteristics impedance (Z_o) under the following conditions: for no loss (iii) for no distortion [2.5+2.5]

GROUP –C

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

6. Define electric field strength due to a point charge. If Coulomb's force, $\mathbf{F} = 2\mathbf{a_x}+\mathbf{a_y}+\mathbf{a_z}$ N, is acting on a charge, of *10 C*, find the electric field intensity, its magnitude and direction. [2+8]

7. Explain point charge, line charge, surface charge and volume charge. If there is a total charge of *10 pC* over a surface area of $0.2\ m^2$, find the surface charge density. [8+2]

8. Establish the relationship among Characteristics impedance, Short-circuit input impedance and Open-circuit input impedance of a lossless transmission line. [10]

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