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**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

(Declared as Deemed-to-be University under Sec.3 of the UGC Act, 1956)

Reg. No. \_\_\_\_\_\_\_\_\_\_\_\_\_

**End Semester Examination – Nov/Dec - 2016**

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|  |  | **Semester :** | **2016-17 ODD** |
| **Code :** | **09EC221** | **Duration :** | **3 hrs** |
| **Sub. Name :** | **ELECTROMAGNETIC FIELDS** | **Max. marks :** | **100** |

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| **Q. No.** | **Questions** | **Marks** |
| **PART-A(10X1=10 MARKS)** | | |
| 1. | Express a vector in spherical coordinate system. | 1 |
| 2. | Mention the significance of Gaussian Surface. | 1 |
| 3. | Define magnetic flux density. | 1 |
| 4. | Define Biot Savart Law. | 1 |
| 5. | \_\_\_\_\_\_\_\_\_\_\_ is the point form of ohms law. | 1 |
| 6. | What is TEM wave? | 1 |
| 7. | Give the expression for inductance. | 1 |
| 8. | Define energy density. | 1 |
| 9. | What are harmonic fields? | 1 |
| 10. | Give the applications of Maxwell’s equation. | 1 |

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| **PART B(5 X 3= 15 MARKS)** | | |
| 11 | State Divergence theorem. | 3 |
| 12 | Express Gauss’s Law for Magnetic Fields. | 3 |
| 13 | Difference between Electric Scalar potential and Electric Vector Potential. | 3 |
| 14 | Illustrate the significance electric and magnetic circuits. | 3 |
| 15 | Discuss the significance of displace current density in Maxwell Equations. | 3 |

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| **PART C(5 X 15= 75 MARKS)** | | |
| 16. | Using Gauss law, Find the Electric flux density due to spherical shell of charge with radius ‘r=a’ for the following cases.  a. Pont P outside the shell(r>a)  b. Point P is on the shell (r=a)  c. Pont P inside the shell (r<a) | 15 |
| (OR) | | |
| 17. | Find the force on a point charge q located at (0,0, h) m due to charge of surface charge density ρs C/m2 uniformly distributed over the circular disc h, z=0m. Also find the electric field intensity at same point. | 15 |
| 18. | Obtain the magnetic-field due to infinite sheet of current using Ampere’s Circuital law. | 15 |
| (OR) | | |
| 19. | Find the magnetic field intensity at the origin due to a current element, , at the point P(3,4,5) in free space. | 15 |
| 20. | Deduce the Electric field boundary condition between conductor and free space. | 15 |
| (OR) | | |
| 21. | Derive the continuity equation of Current. | 15 |
| 22. | Discuss in detail about types of Ferromagnetic Materials. Illustrate hysteresis loop with neat diagram | 15 |
| (OR) | | |
| 23. | Derive the expressions for the inductance of (a) Solenoid (b) Toroid (c) Co-axial cable. | 15 |
| 24. | What is Poynting Vector? Derive the Poynting’s Theorem. | 15 |
| (OR) | | |
| 25. | Elaborate the Four Maxwell’s equations in point form and integral form. | 15 |

ALL THE BEST