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

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**End Semester Examination – Nov/Dec – 2018**

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| **Code :** | **14EE2004** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ELECTROMAGNETIC FIELDS** | **Max. marks :** | **100** |

**ANSWER ALL QUESTIONS (5 x 20 = 100 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | A vector is given by at a point P(10,-8,6). Transform this vector into cylindrical form. | CO1 | 14 |
| b. | If and. Find out the cross product. | CO1 | 6 |
| (OR) | | | | |
| 2. | a. | Obtain the expression for the volume of a sphere of radius R from the differentialvolume. | CO1 | 10 |
| b. | A point is given by C(-3,2,1). Find its angle value in cylindrical coordinate system. | CO1 | 10 |
|  |  |  |  |  |
| 3. |  | A cylindrical capacitor consists of an inner conductor of radius ‘a’ and an outer conductor whose inner radius is ‘b’. The space between the conductors is filled with a dielectric of permittivity and the length of the capacitor is L. Determine the capacitance of this capacitor. | CO3 | 20 |
| (OR) | | | | |
| 4. | a. | Three point charges of 3\*103 µ µC are placed at 3 corners of a square. The side of a square is 0.2m. Find electric field intensity at vacant corners. | CO2 | 13 |
| b. | State and explain Columbs law in detail. | CO1 | 7 |
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| 5. | a. | Using Biot Savart Law, Formulate the due to infinitely long straight conductor. | CO2 | 15 |
| b. | Show the mathematical representation of Ampere’s Circuital Law. | CO2 | 5 |
| (OR) | | | | |
| 6. |  | Derive the expression for magnetic field intensity and flux density of coaxial cable using Ampere’s circuital law and also prove the Ampere’s circuital law. | CO2 | 20 |
|  |  |  |  |  |
| 7. | a. | A capacitor with air as the dielectric medium has a plate area of 1cm2 with a plate separation of 0.1mm. Find the displacement current and displacement current density for an applied voltage of  100 sin (3.14 \* 10 6) t. | CO2 | 10 |
| b. | Derive the expression of Maxwell equation in integral form and differential form. | CO3 | 10 |
| (OR) | | | | |
| 8. | a. | Deduce the magnetic boundary conditions between a conductor and a dielectric. | CO2 | 14 |
| b. | A circular conductor of radius 1.5 mm carries a current of 5.5 sin (4 \* 10 10) t µA. What is the amplitude of displacement current density if the conductivity is 35 M s/m and €r=1. | CO2 | 6 |
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|  | | **Compulsory**: |  |  |
| 9. | a. | Mention the significance of Poynting theorem. | CO3 | 5 |
| b. | A copper sheet has *σ* = 5.8 × 107 siemens/m and *μr*= 1. Calculate the skin depth at the frequency of 100 Hz. | CO3 | 8 |
| c. | Briefly discuss about the parameters of electromagnetic waves when propagated in dielectrics. | CO3 | 7 |