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



**End Semester Examination – Nov / Dec – 2019**

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| **Code :** | **16NT3004** | **Duration :** | **3hrs** |
| **Sub. Name :** | **MAGNETIC NANOMATERIALS AND NANOFLUIDS** | **Max. Marks :** | **100** |

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

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Give the SI units of permeabilityity in free space, magnetic volume susceptibility, mass magnetization, and magnetic field strength. | CO1 | 5 |
| b. | When the magnetic materials are strong in their magnetic behavior? Explain the role of exchange interaction in ferromagnetic materials. | CO2 | 15 |
| **(OR)** | | | | |
| 2. |  | Give a detailed account of the materials showing typical M-H plots like the following:  (i)  (ii) | CO1 | 20 |
|  | | | | |
| 3. |  | Describe magnetocrystalline and shape anisotropies. | CO2 | 20 |
| **(OR)** | | | | |
| 4. |  | Give a account detailed on magnetic domains, domain walls, and domain wall width. | CO3 | 20 |
|  | | | | |
| 5. | a. | Describe the influence of gemoetry and surface on the magnetism of nanoparticles. | CO3 | 10 |
| b. | Explain the role of size on magnetic domain formation. | CO3 | 10 |
| **(OR)** | | | | |
| 6. |  | Explain in detail the magnetism of free nanoparticles and nanoparticles on surfaces. | CO4 | 20 |
|  | | | | |
| 7. |  | Describe the working of vibrating sample magnetometer. | CO4 | 20 |
| **(OR)** | | | | |
| 8. |  | Give a detailed account on permanent magnets and their applications. | CO5 | 20 |
|  | | **Compulsory**: |  |  |
| 9. |  | Discribe in detail the role of magnetic nanoparticles on diagnosis and treatment of cancer. | CO5 | 20 |