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



**UNIVERSITY**

(Karunya Institute of Technology & Sciences)

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

**End Semester Examination – APRIL/MAY – 2017**

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| **Code :** | **16NT3006** | **Duration :** | **3hrs** |
| **Sub. Name :** | **NANOSAFETY AND ENVIRONMENTAL ISSUES** | **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. | What is a nanoparticle? | CO1 | 3 |
| b. | List the unique properties of nanoparticles that makes it hazardous. | CO1 | 7 |
| c. | Discuss the disease caused by inhalation of nanoparticles. | CO1 | 10 |
|  | (OR) |  |  |
| 2. | a. | Explain inhalation. | CO1 | 3 |
|  | b. | Distinguish between “Biopersistance” and translocation of nanoparticles. | CO1 | 7 |
|  | c. | Write short notes on the harmful effects of  i) Dust and silica particles  ii) Metal nanoparticles. | CO1 | 10 |
| 3. | a. | Duscuss the pulmonary toxicity of  i) SWCNT ii) MWCNT | CO1 | 14 |
|  | b. | Explain the mechanism of nanoparticles clearance in the pulmonary system. | CO1 | 6 |
|  |  | (OR) |  |  |
| 4. | a. | Outline the pathways of penetration of nanoparticles across the skin. | CO1 | 5 |
|  | b. | Explain the route of entry of nanoparticle through ingestion. | CO1 | 8 |
|  | c. | Write briefly on the toxicity of absorbed ZnO and TiO2 nanoparticles. | CO1 | 7 |
| 5. | a. | Define “ Cytotoxicity”. | CO1 | 3 |
|  | b. | Summarize the toxicity of absorbed based nanoparticles. | CO2 | 10 |
|  | c. | Write a note on the regulations in force in different countries with respect to nanotechnology. | CO2 | 7 |
|  |  | (OR) |  |  |
| 6. | a. | Explain “Nano Divide”. | CO2 | 4 |
|  | b. | Write short notes on.  i) Grey-Goo scenario.  ii) Military implications of nanotechnology. | CO2 | 16 |
| 7. | a. | Discuss the cytotoxicity of metal oxide nanoparticles. | CO1 | 8 |
|  | b. | List the environmental risks associated with nanotechnology. | CO2 | 5 |
|  | c. | Write a note on “Ecotoxicity”. | CO2 | 7 |
|  |  | (OR) |  |  |
| 8. | a. | Describe briefly on the pulmonary clearance of insoluble solids. | CO1 | 8 |
|  | b. | Write short notes on |  |  |
|  |  | i) Risk assessment related to nanotechnology. | CO3 | 7 |
|  |  | ii) Transportation of nanoparticles. | CO3 | 5 |
|  | | **Compulsory:** |  |  |
| 9. |  | Explain the following :   1. occupational hazards of nanotechnology 2. Impact of nanotechnology on the environment 3. Post humanism | CO3 | (7+7+6) |