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



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

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| **Code :** | **14ME2044** | **Duration :** | **3hrs** |
| **Sub. Name :** | **INDUSTRIAL DESIGN** | **Max. Marks :** | **100** |

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

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. |  | How TRIZ is applied in industrial design? List and explain the thirty nine engineering parameters used to represent contradictions of TRIZ. | CO1 | 20 |
| **(OR)** | | | | |
| 2. | a. | Case study: List out the general problems that are encountered in a turbine of a thermal power plant. Suggest suitable solutions to rectify these problems. | CO1 | 10 |
| b. | Explain problem solving methodology used in the TRIZ with a neat schematic diagram. | CO1 | 10 |
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| 3. | a. | Discuss the important techniques considered during the design phase that are grouped into ten categories. | CO1 | 10 |
| b. | With a neat sketch explain in detail the product life cycle. Give five different products which have been declined. | CO1 | 10 |
| **(OR)** | | | | |
| 4. | a. | Differentiate between re-engineering and reverse engineering with suitable examples. | CO2 | 10 |
| b. | Discuss in detail the techniques of concurrent engineering with neat sketches. Explain how it is advantageous over sequential engineering. | CO2 | 10 |
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| 5. | a. | Discuss the codes of ethics to be followed in industries. | CO2 | 10 |
| b. | Examine the connection between the legal and ethical domains in industrial environments. Give a case study. | CO2 | 10 |
| **(OR)** | | | | |
| 6. | a. | Describe customer oriented design considerations adopted in manufacturing industries. | CO2 | 10 |
| b. | Write about the new emphasis on patents in high-tech industries. | CO2 | 10 |
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| 7. | a. | Describe human factor engineering and ergonomics adopted in automobile design. | CO3 | 10 |
| b. | Discuss about the critical design issues that are considered in user-friendly design. | CO3 | 10 |
| **(OR)** | | | | |
| 8. | a. | Illustrate the organization for design and product development with a neat organizational chart. | CO3 | 10 |
| b. | Explain the types of musculoskeletal disorders experienced by the industrial workers during manual material handling. | CO3 | 10 |
|  | | **Compulsory**: |  |  |
| 9. | a. | Discuss the standards and guidelines framed by OSHA to be followed in industry. | CO3 | 10 |
| b. | How virtual environments improve the safety and productivity of the industrial workers? | CO3 | 10 |