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

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

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| **Code :** | **18EI3024** | **Duration :** | **3hrs** |
| **Sub. Name :** | **ROBOTICS AND FACTORY AUTOMATION** | **Max. Marks :** | **100** |

**ANSWER ANY FIVE QUESTIONS (5 x 16 = 80 Marks)**

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| **Q. No.** | **Sub Div.** | **Questions** | **Course**  **Outcome** | **Marks** |
| 1. | a. | Analyze various robot configurations and list out the various robot motions. | CO1 | 8 |
| b. | Write about origin of robot. | CO1 | 4 |
| c. | Enumerate on gear transmission in robots. | CO1 | 4 |
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| 2. | a. | Explain a robot structure with a sketch. What are the various types of joints used in robots? | CO1 | 8 |
| b. | List the different types of robots. | CO1 | 3 |
| c. | Suggest a suitable system to decide the motion of the robots. | CO1 | 5 |
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| 3. | a. | Explain the working of any four types of sensors with examples. | CO2 | 13 |
| b. | Define gear ratio. | CO2 | 3 |
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| 4. | a. | Write short notes on tactile sensors. | CO2 | 8 |
| b. | With suitable sketch, explain the types of encoders. | CO2 | 8 |
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| 5. | a. | With a neat sketch, explain how image is processed and analyzed in the robot vision system. | CO3 | 10 |
| b. | What is pattern recognition? Describe a sensing device to generate the contour picture of a work piece. | CO3 | 6 |
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| 6. | a. | Name the common imaging devices employed in robot vision system. | CO3 | 3 |
| b. | Analyse various standards involved in image capture and analysis. | CO3 | 13 |
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| 7. | a. | Write steps to drive kinematic model. | CO4 | 4 |
| b. | What are the various inputs to an inverse kinematics algorithm? Explain the functioning of it. | CO4 | 12 |
| **COMPULSORY QUESTION (1 x 20 = 20 Marks)** | | | | |
| 8. | a. | Identify the main parts of the PLC and describe their function. | CO5 | 10 |
| b. | Explain the various communication technologies used in SCADA systems. | CO5 | 10 |