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M.Tech. 3rd Semester (Mechanical Engg.) CBCS Scheme

Examination, December–2018

ROBOTICS AND AUTOMATION

Paper– 16MME 23C2

Time allowed : 3 hours] *[Maximum marks : 100*

Note:
- *There are **Nine** questions in this paper. All questions carry equal marks.*
- *Attempt **five** questions in all.*
- ***Question No. 1 is compulsory.***
- *Attempt remaining **four** questions by selecting only **one** question from each unit.*

1. Explain the following:- 20

(a) Artificial Intelligence.

(b) Description of VAN

(c) Non- servo manipulator

(d) Robot programming languages and systems.

(e) Pneumatic safety

Unit–I

2. (a) Explain the Hydraulic and Electrical actuators and their characteristics and control systems. 10

(b) Explain the Encoders and other feedback systems, vision, ranging systems and textile sensors. 10

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3. (a) Explain the constructional features, advantages and disadvantages of various kinematic structures, servo and Non- servo manipulator. 10

   (b) Describe the Robot Physical configuration and basic Robot motions. 10

Unit–II

4. (a) Describe the concept of automation in Industry. Also describe the mechanisation and automation in detail. 10

   (b) Explain the concept of spatial description and transformations, manipulator kinematics and Inverse manipulator in detail. 10

5. (a) Explain position control of manipulators and force control of manipulators. 10

   (b) Describe the Logged Locomotion and Export system. Also explain the Kinematics Jacobians. 10

Unit–III

6. Explain the pneumatic and hydraulic valves, flow control valves, metering valves and direction control valves in detail. 20

7. (a) Explain Air Cylinders - their design and mountings in detail. 10

   (b) Explain the hydraulic servo systems, pneumatic safety and remote control circuits. 10

Unit–IV

8. Explain the basis of Automated work piece handling with their working principles and techniques. Also explain the Transfer mechanisms automated feed out of components. 20

9. Explain the following: 20

   (a) Assembly automation

   (b) Automatic packaging

   (c) Automatic Inspection

   (d) Job orienting and feeding devices.

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