

Total No. of Questions : 12]

SEAT No. :

P788

[Total No. of Pages : 2

[4659]-156

**B.E. (Production Sandwich)**

**C: COMPUTER INTEGRATED MANUFACTURING AND  
INDUSTRIAL ROBOTICS**

**(2008 Pattern) (Semester - I) (Elective - I)**

*Time : 3 Hours]*

*[Max. Marks : 100*

*Instructions to the candidates :*

- 1) *Answer any three questions from Section I and any three questions from Section II.*
- 2) *Answers to the two sections should be written in separate answer books.*
- 3) *Use of calculator is allowed.*
- 4) *Figures to the right indicate full marks.*
- 5) *Answer one question from 1 & 2, 3 & 4, 5 & 6, 7 & 8, 9 & 10, 11 & 12.*

**SECTION - I**

- Q1)** a) List out the different models used in CIM? Draw the neat sketch of IBM Models and compare with various Models? [12]  
b) Explain need of Models in CIM. [4]  
OR
- Q2)** a) Explain the role Prototyping in CIM along with example. [8]  
b) Explain the following in detail : [8]  
i) Concept of Solid ground Curing.  
ii) Application Rapid tooling methods to Press tool Manufacturer.
- Q3)** a) Explain the Basic Anatomy e of Robotics in detail along with example. [8]  
b) Derive the equation of Kinematics using Homogeneous Transformation. [8]  
OR
- Q4)** a) Explain the Principle of Denna-vati-Hartenberg s convention for dynamics Analysis of Joints along with suitable example. [12]  
b) Explain the Concept of Spatial mechanism. [4]
- Q5)** a) Explain the Mechanical of drives used in Robotics. [6]  
b) Using a schematics diagram represent a hydraulic circuit to explain the Drives system of bang-bang robot having waist motion. Shoulder and Arm expansion respectively. [12]

**P.T.O.**

OR

- Q6)** a) Explain different types of Actuators used in typical Robot along with sketch. [10]  
b) Write a short note on Power transmission system in Robotics. [4]  
c) Explain the concept of basics motion conversion System. [4]

**SECTION - II**

- Q7)** a) Explain the role computer in gripper design. [8]  
b) A 10 kg rectangular block is gripped in the middle and lifted vertically at velocity 1 m/s. If it accelerates to this velocity at  $40.5 \text{ m/s}^2$  and the Coefficient of friction between the gripping pad and block is 0.785. Calculate minimum force that would prevent slippage. [8]

OR

- Q8)** a) Explain concept finite element analysis in grippers designs for pressure Foragile. [8]  
b) Write a short note on Special purpose gripper design. [8]
- Q9)** a) What are the different types of Sensors used in Robotics? Classify. [8]  
b) Explain the factors affecting the selection of Sensors for the particular Application. [8]

OR

- Q10)** a) What is Robot vision? What are the types of vision sensors used to take the image of an object? [8]  
b) Explain important technique use in Robot Vision System. [8]
- Q11)** a) Explain along with sketch the application Robot in the following area.[12]  
i) In Foundry Industry.  
ii) Mining Industry.  
iii) Packaging of Boxes.  
b) Explain the application of CLIMBING Robot in detail. [6]

OR

- Q12)** Write a short note on following : [18]  
a) Modular design concept in robotics.  
b) Intelligent robotics.  
c) Vector Assembly Languages used for programming in robot.

