

**SUBJECT CODE:- 301**  
**FACULTY OF ENGINEERING AND TECHNOLOGY**  
**B.E.(MECH/PROD) Examination Nov/Dec 2015**  
**Robotics & Industrial Application**  
**(OLD)**

[Time: Three Hours]

[Max. Marks: 100]

“Please check whether you have got the right question paper.”

- N.B i) Attempt any three questions from each section.  
 ii) Draw neat sketches wherever required.  
 iii) Assume suitable data wherever necessary & state it correctly.

**Section A**

- |     |   |          |
|-----|---|----------|
| Q.1 | a) Explain common robot configuration. (five configuration)<br>b) Draw & explain robot construction showing how a robot is made up of a series of joint link combinations.          | 10<br>06 |
| Q.2 | a) Explain the following manipulators with two degrees of freedom<br>i) an OO robot      ii) an RR robot<br>b) Define work envelope of a robot.                                     | 12<br>04 |
| Q.3 | a) Explain D-H representation.<br>b) Compare drive systems of an industrial robot.  | 08<br>08 |
| Q.4 | a) For trajectory planning, what are the general considerations in path description?<br>b) Illustrate the concept of repeatability versus accuracy in reference to robot operation. | 08<br>08 |
| Q.5 | Write short note on the following.<br>i) Robot arm dynamics<br>ii) Robotic joints<br>iii) Scara body & arm assembly   | 18       |

**Section-B**

- |      |   |          |
|------|---|----------|
| Q.6  | a) Enlist various point to be considered while selecting a sensor.<br>b) Enlist & explain the mechanical grippers.  | 06<br>10 |
| Q.7  | a) What is the need of vision in a robotic system? How image acquisition is carried out?<br>b) Describe the role of robot in material handling application. | 08<br>08 |
| Q.8  | a) Distinguish between magnetic & vacuum grippers.<br>b) Describe program control & data processing in robot language.                                      | 08<br>08 |
| Q.9  | a) Explain the application of robot in welding & spray painting.<br>b) Describe type of camera and system interface in vision system                        | 10<br>06 |
| Q.10 | Write short note on the following.<br>i) Artificial intelligence in robotics<br>ii) Robot application in inspection<br>iii) Vision sensors                  | 18       |