

**B. TECH. (CBCS - 2014 COURSE) SEM - VIII (MECHANICAL  
ENGG.) : SUMMER - 2018**

**SUBJECT: ELECTIVE-III INDUSTRIAL AUTOMATION AND ROBOTICS**

Day: **Saturday**  
Date: **09/06/2018**

**S-2018-4699**

Time: **02.30 PM TO 05.30 PM**  
Max. Marks: 60

**N.B.:**

- 1) All questions are **COMPULSORY**.
- 2) Figures to the right indicate **FULL** marks.
- 3) Draw neat diagram **WHEREVER** necessary.
- 4) Use of non-programmable calculator is **ALLOWED**.
- 5) Assume suitable data, if necessary.

- 
- Q.1 Draw a block diagram of automation system and explain function of each block. (10)
- OR**
- Q.1 State and explain different levels of automation. (10)
- Q.2 Explain with the help of neat sketch the automation migration strategies. (10)
- OR**
- Q.2 Define the concept of line balancing. Explain any one line balancing algorithm. (10)
- Q.3 State the laws of robotics and explain robot anatomy. (10)
- OR**
- Q.3 Explain different robot motions with respect to (10)
- i) Arm and body motion
  - ii) Wrist motion
- Q.4 What is mean by tactile sensor? Explain in detail working of touch sensor and force sensor. (10)
- OR**
- Q.4 Explain working of following grippers with neat sketches (10)
- i) Vacuum Grippers
  - ii) Magnetic Grippers
- Q.5 Explain forward and reverse kinematics of robot manipulator. Also define joint space and world space system. (10)
- OR**
- Q.5 Derive the expression for forward and reverse kinematics for 4-DOF robot manipulator in 3 Dimensions. (10)
- Q.6 How teach pendant works? What is it's role in robot programming. (10)
- OR**
- Q.6 What are the different types of robot programming methods? Explain concept of on-line and off-line programming. (10)

\* \* \* \* \*