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Question Paper Code : 51830

B.E./B.Tech. DEGREE EXAMINATION, MAY/JUNE 2016

Seventh Semester

Mechanical Engineering

**ME 2028/ME 702/IC 1404/080120060/10177 MEE 22/10122 MEE 22 – ROBOTICS /
INDUSTRIAL ROBOTICS**

(Common to Production Engineering and Automobile Engineering)

(Regulations 2008/2010)

Time : Three Hours

Maximum : 100 Marks

Answer ALL questions.

PART – A (10 × 2 = 20 Marks)

1. What do you understand from the notation 'TRR' of a robot ?
2. How can you categorize a robot ?
3. State any two selection parameters of pneumatic drive in robotics.
4. List any two applications of internal grippers.
5. What is resolver ?
6. Mention any two uses of a Hall effect sensor.
7. Distinguish between forward and reverse kinematics.
8. Write any two sensor commands used in robotics.
9. How does a RGV differ from an AGV ?
10. Expand EUAC.

PART – B (5 × 16 = 80 Marks)

11. (a) (i) Specify a SCARA robot. Explain its working with a neat sketch and narrate a few industrial applications. (12)
(ii) What are the importance of DOF in a robot selection? (4)
- OR**
- (b) (i) Sketch and explain the working of Cartesian co-ordinate robot and mention the importance of work envelope. (12)
(ii) How can you identify the needs of a robot in industries? (4)
12. (a) (i) What are the mechanical drives used in robots? Explain any three with neat sketches. (12)
(ii) List any four practical usages of a Vacuum gripper. (4)
- OR**
- (b) (i) Discuss the design and selection parameters of three fingered grippers. (10)
(ii) Make comparison between A.C and D.C servo motors, used in robots. (6)
13. (a) (i) State and explain the triangulation principle. Write any two uses. (8)
(ii) How does Machine Vision work to inspect the parts? Explain. (8)
- OR**
- (b) (i) Explain any one algorithm used for image processing and analysis in Machine Vision. (8)
(ii) Discuss the working of any two touch sensor used in robotics. (8)
14. (a) (i) What is geometric solution approach? Discuss with a suitable example. (12)
(ii) State the four parameters involved in Denavit-Hartenberg method. (4)
- OR**
- (b) (i) Explain the structure of VAL with suitable examples. (12)
(ii) State the applications of lead through programming technique in robotics. (4)
15. (a) (i) Describe the challenges to the implementation of robots in industries. (12)
(ii) What is payback method? (4)
- OR**
- (b) Discuss the following :
- (i) Safety considerations for robots operations in automobile industries. (8)
(ii) Discuss the impacts of robots on society and workers in India. (8)