U.S.N

P.E.S. College of Engineering, Mandya - 571 401

(An Autonomous Institution affiliated to VTU, Belgaum)
Third Semester, M. Tech. - Mechanical Engineering (MCIM)
Semester End Examination; Dec - 2016/Jan - 2017
Industrial Automation

Time: 3 hrs   Max. Marks: 100

Note: i) Answer **FIVE** full questions, selecting **ONE** full question from each unit.
ii) Use of Statistical Quality Control Factor data sheets/Book is permitted.

UNIT - I

1 a.	Explain the USA principle of Automation.	10
b.	Name the different categories of material transport equipments. Give their features and applications.	10
2 a.	Explain briefly the strategies for Automation and Process Improvement.	10
b.	Explain briefly the different AIDC technologies. Give their applications.	10

UNIT - II

3 a.	List the distinct manufacturing systems along with their features.	10
b.	Compare continuous control and discrete control.	10
4 a.	What are the issues of planning and design of FMS? Explain briefly.	10
b.	List desirable features for selecting measuring devices.	10

UNIT - III

5 a.	Sketch and explain various part feeding devices.	10
b.	Write diagrammatic representation of shop floor control system. Explain the three important phases.	10
6 a.	Sketch and explain different AGV systems.	10
b.	Mention the different types of factory data collection systems along with their limitations. Explain briefly various structures of Automated FDCS terminals.	10

UNIT - IV

7 a. List the SPC tools. Explain the Pareto diagram.   10

b. A precision industry manufactures leads for a drafting instrument. The diameter of eight samples (m) of size (n) 5 was measured for each part. Determine the control limits and show that the process is under control. The calculated values of $\bar{X}$ and R values are given in Table 7b. The statistical constants are $A_2 = 0.577$, $D_3 = 0$, and $D_4 = 2.114$ for a sample size of 5.   10

Table 7b.

S	1	2	3	4	5	6	7	8
$\bar{X}$	2.008	1.998	1.993	2.002	2.001	1.995	2.004	1.999
R	0.027	0.011	0.017	0.009	0.014	0.020	0.024	0.018

8 a. Explain cause and effect diagram with an illustration.   8

  b. What is CMM? Explain its construction.   12

UNIT - V

9 a. Write the structure of MRP system and explain.   10

  b. What is CAPP? Explain Retrieval CAPP.   10

10 a. List the outputs of MRP.   8

  b. What is the capacity planning? Explain the two stages clearly.   12

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