GANPAT UNIVERSITY
M.Tech.[ME(CAD/CAM)] Sem-II
REGULAR EXAMINATION JULY 2013
3ME215 AUTOMATION IN PRODUCTION & QUALITY ENGINEERING

TIME – 3 HOURS   **TOTAL MARKS- 70**

INSTRUCTION:-   1)   All questions are compulsory.
                    2)   Figures to the right indicate full marks.
                    3)   Make suitable assumptions wherever necessary.

SECTION-I

Que-1   **[12]**

    (a)   Explain T.Q.M. operation in brief.

    (b)   "Inspection planning is a part of planning for quality". Comment.

    (c)   What are the basic elements of reliability?

                                          OR

Que-1   **[12]**

    (a)   Explain the quality and reliability.

    (b)   Enlist Juran's steps for quality improvement and explain them in brief.

    (c)   What is lean manufacturing? Explain it.

Que-2   **[11]**

    (a)   What is the meaning of quality of conformance? Explain the factors which influence the quality of conformance.

    (b)   Control charts for $\bar{X}$ and σ are maintained on the weight in kg. of the contents of a certain container. The subgroups size is 10. The values of $\bar{X}$ and σ are conputed for each subgroup. After 18 subgroups $\sum \bar{x} = 595.8$ and $\sum \sigma = 8.24$. Compute the values of σ' on the assumption that the process is in statistical control. Take $A_1 = 1.03$, $B_4 = 1.73$ and $B_3 = 0.28$.

                                          OR

Que-2   **[11]**

    (a)   Define the term "Quality control" and explain its advantages over inspection techniques.s

    (b)   Control charts for $\bar{X}$ and R are maintained on the tensile strength of a certain yarn. The subgroups size is 5. The values of $\bar{X}$ and R are conputed for each subgroup. After 25 subgroups $\sum \bar{x} = 514.8$ and $\sum R = 120.0$ compute the values of 3-sigma limits for the $\bar{X}$ and R chart and estimate the value of σ' on the assumption that the process is in statistical control. Take $d_2 = 2.326$, $D_3 = 0$ and $D_4 = 2.11$

Que-3   **Attempt Any three.**   **[12]**

    (a)   Describe Taguchi's parameter design and Tolerance design briefly.

    (b)   Describe robust design with example.

    (c)   What is concurrent engineering? Write down advantages of it.

    (d)   Explain ANOVA analysis.

SECTION-II

Que-4   [12]

   (a)   What are the strategies for Automation?

   (b)   What is a mechatronics system? How it integrates various discipline of engineering explain with an example?

OR

Que-4   [12]

   (a)   Explain working principle of Inductive and Capacitive proximity sensor with neat sketch.

   (b)   What is Sensor? Explain Sensor used in Automated manufacturing.

Que-5   [11]

   (a)   Why PLC system as more preferable in Automated manufacturing system?

   (b)   Where PID control is used? How three constants affect the control performance?

OR

Que-5   [11]

   (a)   Define registers and explain different registers used in 80.85 microprocessor.

   (b)   Draw block diagram of PLC. Explain function of various blocks.

Que-6   **Attempt Any three.**   [12]

   (a)   Enlist basic components of hydraulic system. And Explain all components.

   (b)   What do you mean by close loop control system? Explain servo motor.

   (c)   What is the difference between hydraulics and pneumatics? What are their applications?

   (d)   Briefly Explain Pressure relief valve. Draw the symbols for Pressure relief valves used in hydraulics.

********END OF PAPER********