M. Tech morning
Q.: 04/06/2014.

Exam No: _____

GANPAT UNIVERSITY

M.Tech.[ME(CAD/CAM)] Sem-II

REGULAR EXAMINATION JUNE-2014

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) What is concurrent engineering? Explain it.
(b) What are the different terms of ANOVA analysis?
(c) Write a short note on the factors which are influence the quality of conformance.

OR

Que-1 [12]

(a) What is reverse engineering? Explain it.
(b) What is robust design? How its play important role for quality improvement?
(c) Describe briefly the three fundamental principles on which Taguchi's philosophy is founded.

Que-2 [11]

(a) Write a short note on lean manufacturing..
(b) Control charts for $\bar{X}$ and σ are maintained on the weight in grams 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 3σ limits for $\bar{X}$ and σ chart. Take $A_1 = 1.03$, $B_4 = 1.73$ and $B_3 = 0.28$.

OR

Que-2 [11]

(a) Describe the components of JIT in brief.
(b) Determine the control limits for $\bar{X}$ and R charts if $\sum \bar{x} = 357.50$, $\sum R = 9.90$, Number of subgroups = 20. It is given that $A_2 = 0.18$, $D_3 = 0.41$, $D_4 = 1.59$ and $d_2 = 3.735$. Also find the process capability.

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

(a) Name and describe the various steps in the application of Six Sigma.
(b) What is design for reliability? Explain different factors which are considered for it.
(c) Describe the benchmarking in connection with TQM.
(d) what are the benefits of statistical quality control.

SECTION-II

Que-4 [12]

(a) Explain working principle of Capacitive proximity sensor with neat sketch
(b) Briefly Explain Pressure relief valve. Draw the symbols for Pressure relief valves used in hydraulics.

OR

Que-4

(a) Explain working principle of Inductive proximity sensor with neat sketch. [12]

(b) What is the application of rotary encoders in close loop systems? How will you select the type of encoder for particular application?

Que-5

(a) Define registers and explain different registers used in 8085 microprocessor [11]

(b) What is the difference between Hard Automation and Soft automation? Explain with Example. What are the advantages of Soft automation over Hardwire automation?

OR

Que-5

(a) Explain the role of Mechatronics in manufacturing. [11]

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

Que-6 **Attempt Any three.**

(a) Enlist basic components of hydraulic system. Explain any two components. [12]

(b) What is the relation between automation and CIM? Explicate reasons to justify the use of automation.

(c) What is the difference between close loop control system and open loop control system.

(d) How many type of miscellaneous sensor? Describe it.

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