

EYMI
Date: 03/06/2015.

Exam No: _____

GANPAT UNIVERSITY
M.Tech.MECHANICAL (CAD/CAM)]
Sem-II REGULAR EXAMINATION MAY-JUNE-2015
3ME215 AUTOMATION IN PRODUCTION & QUALITY ENGINEERING
TIME – 3 HOURS **TOTAL MARKS- 60**

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

SECTION-I

- Que-1 (A) What is the role of automation in manufacturing industry? Explain cost effective automation with an example. [5]
- (B) What are the obstacles in transformation of laborious manufacturing process into highly automated manufacturing facilities? [5]

OR

- Que-1 (A) Which are the various types of interface elements used to drive relays and actuators through PLC, Microcontroller or computer? Explain each of them in detail. [5]
- (B) Explain various types of production systems. [5]

- Que-2 (A) Explain fixed and programmable automation with example and compare them. [5]
- (B) Enlist various sensors used in automation. Explain any two with their working principle [5]

OR

- Que-2 (A) Write down the fundamental equation of PID control method and explain the effect of each term on the control action. [5]
- (B) Explain types of memory used in and by microprocessor. [5]
- Que-3 (A) What is PLC? Explain the working of PLC with block diagram in detail. [5]
- (B) Differentiate hydraulics and pneumatics. Explain application of each of them with circuit diagram. [5]

SECTION-II

- Que-4 (A) What is the meaning of quality of conformance? Explain the factors which influence the quality of conformance. [4]
- (B) Control charts for \bar{X} and R are maintained on certain dimensions of a manufactured part, measured in mm. The subgroups size is 4. The values of \bar{X} and R are computed for each subgroup. After 20 subgroups $\sum \bar{x} = 412.83$ and $\sum R = 3.39$. 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 $d_2 = 2.059, D_3 = 0$ and $D_4 = 2.28$ [6]

OR

Que-4 (A) What is the meaning of quality of design? Explain the factors which influence the quality of design. [4]

(B) Define Six Sigma, explain the concept of Six Sigma quality approach. [6]

Que-5 (A) Write short note on Taguchi's philosophy. [5]

(B) Define T.Q.M. State the chief requirement for the successful working of T.Q.M. programme in an industrial organization. [5]

OR

Que-5 (A) Explain failure pattern for complex product. [4]

(B) An element has probability of successful operation over a given period of 70 per cent. If four such elements are connected in parallel estimate the improvement factor. [3]

(C) If an element having mean life of 5000 hours and a uniform failure rate, what is the reliability associated with a specified service period of 200 hours? [3]

Que-6 (A) Explain concurrent engineering. [5]

(B) Write a short note on lean manufacturing. [5]

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