Exam No: _____

GANPAT UNIVERSITY
M.Tech.MECHANICAL (AMT)
Sem-II REGULAR EXAMINATION MAY-JUNE-2015
3ME204 PRECISION & 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)   Describe in detail the laser interferometer with figure.   [5]

        (B)   Discuss in detail about the laser welding process with neat sketch.   [5]

                                   OR

Que-1   (A)   Discuss in detail about the high speed machining process.   [5]

        (B)   Explain in detail Ultra precision machining process.   [5]

Que-2   (A)   What is Magnetic float polishing process? Describe it with a neat sketch.   [5]

        (B)   Discuss in detail about the LIGA process.   [5]

                                   OR

Que-2   (A)   Write in detail about an air bearing with a neat sketch.   [5]

        (B)   What is defect categorization in precision vision, inspection & measurement system?   [5]

Que-3   (A)   Give the types of micromachining process and explain one of it with neat sketch in   [3]
               detail.

        (B)   Describe the comparison between normal, precision & ultra-precision machining.   [3]

        (C)   Discuss in detail about the product's life cycle.   [4]

SECTION-II

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

        (B)   Control charts for $\bar{X}$ and R are maintained on certain dimentions of a manufactured part,   [6]
               measured in mm. The subgroups size is 4. The values of $\bar{X}$ and R are conputed 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

                                   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********