

GANPAT UNIVERSITY
M. Tech. Semester II Mechanical Engineering
(Advanced Manufacturing Techniques)
Regular Examination May - June: 2012
3ME204 - Precision & Quality Engineering

Time: 3 Hours

Total Marks: 70

- Instruction: (1) Answers of two sections must be written in the separate answer book.
 (2) Draw neat sketches wherever necessary.
 (3) Assume suitable additional data wherever necessary.

SECTION - I

- Q-1 (a) "Quality is the only option for survival of an organization in the area of globalization" [11]
 Justify the statement with appropriate practical illustrations.
 (b) What is product reliability? Discuss the various ways and means to improve the reliability of product.

OR

- Q-1 (a) What is six sigma concepts? Discuss the steps for implementation of six sigma quality approach to Indian industries. [11]
 (b) The following data were obtained during manufacturing of the axle of car from supplier. The variable of interest is diameter. The Subgroup size is five and the value of $d_2 = 2.326$

Sample No.	1	2	3	4	5	6	7	8	9	10
X	53	52	54	55	54	56	52	55	56	54
R	6	4	3	9	6	4	7	3	4	2

Sample No.	11	12	13	14	15	16	17	18	19	20
X	55	53	52	55	54	55	56	52	55	53
R	2	4	5	5	4	2	3	4	4	2

- (i) Compute the centre line & control limits of X & R chart for controlling future production.
 (ii) Calculate process capabilities C_p & C_{pk} and what conclusions can you draw about ability of the process to produce products within specifications limits?
- Q-2 (a) Define Total Productive Maintenance along with its basic principals and requirements. [12]
 (b) Discuss the Eight Dimensions of Quality as suggested by David Garvin.
 (c) What is ISO - 9000, QS - 9000 and ISO - 14000? Discuss the implementation of ISO 9000.

OR

- Q-2 (a) What is TQM? Discuss the elements of TQM. [12]
 (b) What is Benchmarking? State the objectives of Benchmarking. Discuss the steps involved in implementation of Benchmarking.
 (c) What is Lean manufacturing? Discuss the benefits of Lean manufacturing.

- Q-3 Write short notes on any three. [12]
- (a) Cause and Effect Diagram
 - (b) Concurrent Engineering
 - (c) Quality Assurance and Quality Control
 - (d) Taguchi Method.

SECTION II

- Q-4 (a) What is Difference between Conventional machining and Micromachining? [12]
(b) In Precision And Quality Engineering, What is LIGA Process?
(c) Give detail about Wet Etching and Dry Etching Processes.

OR

- Q-4 (a) In industries, What is need of High Precision Process? [12]
(b) Explain combination of MEMC and Manufacturing.
(c) What is LASER machining process? Discuss drawback of LASER machining process.

- Q-5 (a) According to Machining phenomena, Explain Unit Removal and Classification. [11]
(b) Give Five major steps of Product's Life Cycle, and Explain one of them.
(c) What is MEMC? Explain in MEMC system and also Explain Sensor and Actuator.

OR

- Q-5 (a) Explain Honing Process. [11]
(b) What is Metal burnishing process? Discuss advantages, Limitations and field of application of burnishing.
(c) Notable Advantages of Precision Grinding over Diamond turning.

- Q-6 **Attempt Any three** [12]
(a) What is Nano & Nanotechnology? Application of Nano precision.
(b) Explain in detail Magnetic Float Polishing Process.
(c) How Defect categorization in Precision vision, Inspection & Measurement System.
(d) Explain in detail Lapping Process.