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# MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
A Constituent Institution of Manipal University

**SIXTH SEMESTER B.TECH. (PRINT AND MEDIA TECHNOLOGY)**

**END SEMESTER EXAMINATIONS, APR/MAY 2017**

## ELECTIVE IV - QUALITY MANAGEMENT FOR GRAPHICS ARTS [PMT4016]

**REVISED CREDIT SYSTEM**
**(29/04/2017)**

Time: 3 Hours MAX. MARKS: 50

**Instructions to Candidates:**

- Answer **ALL** the questions.
- Missing data may be suitably assumed.

**1A.** A process capability study was conducted to analyze the ink grinding/milling process in an offset ink manufacturing unit. The fineness of ink grinding was measured and analyzed. The process specification was set at **5 ± 1** microns. 35 random samples were collected from the ink grinding process and their fineness was measured and tabulated in the table below. The data collected forms a normal distribution. Determine the process capability and find the percentage of samples not meeting the above specifications.

| Sample No. | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ink fineness of grind(microns) | 1.0 | 6.0 | 2.0 | 5.0 | 4.0 | 6.0 | 7.0 | 5.0 | 9.0 | 8.0 | 5.0 | 7.0 |

| Sample No. | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Ink fineness of grind(microns) | 8.0 | 5.0 | 3.0 | 6.0 | 5.0 | 3.0 | 7.0 | 4.0 | 10.0 | 7.0 | 6.0 | 9.0 |

| Sample No. | 25 | 26 | 27 | 28 | 29 | 30 | 31 | 32 | 33 | 34 | 35 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Ink fineness of grind(microns) | 6.0 | 8.0 | 5.0 | 4.0 | 6.0 | 3.0 | 5.0 | 7.0 | 4.0 | 5.0 | 8.0 |

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**1B.** Define and explain 5S system practiced in total quality management, its various steps and their importance.

**1C.** Explain the criteria for selection of a team leader and the area of training a team leader.

**[ 04 + 03 + 03 ]**

**2A.** Differentiate between “prevention strategy” and "balanced prevention and inspection/appraisal strategy” practiced in economics of quality. Which strategy is good and why? Explain with the help of a diagram

**2B.** Explain PDCA cycle for supplier certification process.

**2C.** Explain the different levels of Benchmarking process using suitable examples.

**[ 04 + 03 + 03 ]**

**3A.** During a quality test conducted at packaging testing work following data was generated. The sample size was not constant and the data was collected continuously for 10 hours of production. Construct a fraction defective control chart for the data and decide whether the package printing process is in control or not? Revise the limits if found out of control and draw the charts.

| Hour | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| Number of sheets tested | 155 | 130 | 110 | 135 | 128 | 140 | 210 | 170 | 180 | 175 |
| No, of defective sheets found | 20 | 13 | 10 | 18 | 28 | 13 | 15 | 17 | 25 | 28 |

**3B.** What is meant by data collection process? What are the precautions to be taken in data collection and measurement process?

**3C.** Differentiate between Total Quality Management and Traditional management by considering six different aspects.

**[ 04 + 03 + 03 ]**

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**4A.** M/s Amarnath Print Pack solutions, is a leading manufacturer and exporter of flexible packages for food industry. Recently the quality control department submitted their report on the latest printed flexible packages for a multinational company. The report listed the details about various quality rejections and the number of packages which failed to meet the customer requirement. The Production manager has been assigned with the task of sorting out these technical issues and reducing the quality rejections in the future production. Apply Pareto analysis and solve the problem.

| Sl. No | Name of the print defect | Number of packages rejected |
|---|---|---|
| 1 | Ink Streaks | 54 |
| 2 | Misting dots | 38 |
| 3 | Dot gain | 80 |
| 4 | Chattering marks | 49 |
| 5 | Ghosting | 78 |
| 6 | Ink spitting | 84 |
| 7 | Halo effect | 59 |

**4B.** Define "Process Re-engineering" in TQM. Explain the three phases of Process Re-engineering?

**4C.** Frame six questions using WHY technique to find the root cause for the following printing problem.

"In Adhesive label manufacturing the wastage is increased by 10%"

**4D.** Differentiate between Conventional wisdom and contemporary view of the quality.

**[ 03 + 03 + 02 + 02 ]**

**5A.** Define "Six sigma concept" in Total quality management and explain the two methodologies used in six sigma.

**5B.** What are the various dimensions of a product quality? Explain with suitable examples.

**5C.** What are the four categories of Cost of Quality? Explain each in detail.

**5D.** Explain at least five benefits of using ISO 9000.

**[ 03 + 03 + 02 + 02]**