MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
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VII SEMESTER B.TECH. (MEDIA TECHNOLOGY)

MAKE-UP EXAMINATIONS, DEC-JAN 2023

SUBJECT: QUALITY MANAGEMENT FOR GRAPHIC ARTS [MED 4069] - PE- 6

REVISED CREDIT SYSTEM

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Define the term "Quality"? Explain three different definitions of quality

1B. Write six differences between benchmarking and the re-engineering process

1C A Flexographic printing machine manufacturer wishes to control the number of defects in a subassembly area. The data is shown for **16** lots with a sample size of **5**. Set up a control chart for defects per unit. Do these data come from a controlled process? If not, calculate the revised control chart parameters.

Sample number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Number of defects	14	8	7	6	4	9	10	11	34	5	23	12	8	6	3	6

[03+ 03 + 04]

2A. Define "Poka - Yoke" and explain it with two suitable examples from the printing industry

2B. Frame six answers for the following statements using the Contingency method

"How to reduce the efficiency of the binding department?".

2C M/s Amarnath Print Pack solutions is a leading manufacturer and exporter of flexible packages for the 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 that failed to meet the customer's requirement. The Production manager is assigned to sort out these technical issues and reduce the quality rejections in 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

[03+ 03 + 04]

3A. In detail, justify the following statements of Deming's Philosophy of Quality for management with suitable examples.

a) Eliminate the use of slogans, posters, and exhortations
b) Eliminate work standards and numerical quotas
c) Overemphasis on visible figures

3B. Explain the 5S system and its methodology

3C In a thermal paper coating plant, a study was conducted to check the effect of change in the air blow rate of the air knife coater on thermal paper coating thickness. Data was collected on thermal coating thickness for different air blow rates and tabulated in the table below. Using mathematical regression analysis, establish the correlation between air blow rate and thermal coating thickness and find the air blow required to deposit 6.2 microns of the thermal coating layer.

Air blow rate (mm of water)	10	12	14	16	18	19	20	21	24	26
Thermal coating Thickness (Micron)	5	5.1	4.9	4.9	4.6	4.8	4.3	3.8	3.6	3.2

[03+ 03 + 04]

4A. What are the four categories of Cost of Quality? Explain each in detail

4B. Explain the process of Quality Assurance. Describe the various activities involved in Product Quality assurance and their significance

4C In the Packaging and printing industry, Plastic buckets are being printed using a dry offset printing process. To have good printability, the surface energy of these plastic buckets was improved through Plasma surface treatment. The surface energy of the treated bucket is the quality parameter under study. The following data represents the surface energy of 20 different lots with average surface energy. Analyze the process using X bar and R charts. Draw the graphs and give the right conclusion on your findings.

Lot No.	1	2	3	4	5	6	7	8	9	10
Surface energy (Dynes/cm^2)	38	37	42	45	39	44	32	37	38	36

Lot No.	11	12	13	14	15	16	17	18	19	20
Surface energy (Dynes/cm^2)	38	47	56	49	44	45	42	37	34	38

[03+ 03 + 04]

5A. Explain the PDCA cycle with a suitable example

5B. Explain the different levels of Benchmarking process using suitable examples

5C In a production process of a paper board, stiffness strength was under investigation for quality production. The stiffness strength values form a normal distribution with a mean of **182** Taber units and a standard deviation of **4.2**. If the product specification was set at **185 ± 6** Taber units, then calculate the process capability indices and percentage of products falling beyond specifications, if any

[03+ 03 + 04]