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MANIPAL INSTITUTE OF TECHNOLOGY
MANIPAL
(A constituent unit of MAHE, Manipal)

VI SEMESTER B.TECH. (MEDIA TECHNOLOGY)

END SEMESTER EXAMINATIONS, APRIL/MAY 2019

SUBJECT: QUALITY MANAGEMENT FOR GRAPHIC ARTS [PMT 4016]

REVISED CREDIT SYSTEM
(03/05/2019)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Explain the different criteria to select a team leader is selected for Quality projects.

1B. Differentiate between "Cause and Effect diagram" and "Scatter diagrams" with suitable examples.

1C. A Shampoo manufacturing unit receives 15 lots of secondary cartons from a printer. These are subjected to quality inspection before they are filled with shampoo bottles for sending to the market. The table below represent the number of defective cartons found in 15 different lots by the quality executives. Using defects per unit chart, decide whether the process of carton manufacturing is in control or not. If not revise the control limits and conclude on your findings.

Lot No	1	2	3	4	5	6	7	8
No, of Cartoons Tested	1200	1300	1250	1340	1260	1400	1300	1320
Defective cartons	45	68	65	49	45	49	51	55

Lot No	9	10	11	12	13	14	15
No, of Cartoons Tested	1350	1250	1260	1350	1400	1250	1350
Defective cartons	54	48	68	98	102	45	48

[03 + 03 + 04]

2A. Define "Six sigma concept" in Total quality management and explain the two methodologies used in six sigma.

2B. Discuss the various levels of Benchmarking using suitable examples.

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2C. In a Packaging and printing industry, Plastic buckets are being printed using dry offset printing process. To have good printability, surface energy of these plastic buckets were improved through Plasma surface treatment. The surface energy of the treated bucket is the quality parameter under study. 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]

3A. Explain ISO 9000 series of standards and four advantages of implementing ISO in an organization.

3B. Explain the four different types of strategies that are available in Production and Marketing with neat diagram.

3C. In a thermal paper coating plant, a study was conducted to check the effect of change in air blow rate of 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 micron of 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. Differentiate between process Re- engineering and Kaizen with suitable examples.

4B. Justify the following statements of Deming's Philosophy of Quality for management in detail with suitable examples.

a) Eliminate the use of slogans, posters and exhortations
b) Eliminate work standards and numerical quotas
c) Create constancy of purpose for continual improvement of product & services

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4C. In a stone paper manufacturing industry, the quality parameter under study was the brightness of the substrate. In order to study the process capability several random samples were taken from the production and analyzed. The data collected forms a normal distribution with mean 78% and standard deviation of 4. If the specification for the production of the stone paper is 80 ± 3 % then calculate the followings;

a) Process capability indices
b) Percentage of defects

[03 + 03 + 04]

5A. Explain the minimum qualifications required to become a Quality Guru / facilitator?

5B. Frame six questions using WHY-WHY techniques to find the root cause for the following printing problems.

a) "In package die cutting process wastage has increased to 10%"

b) "Overall efficiency of 4 color flexographic printing machine has come down to 55%"

5C. A company manufacturing laser systems for engraving gravure cylinders, claims that laser system has a target life of producing 25,000 gravure cylinders. If its life deviates from this expected number in either side by 2,000 then there will be a repair cost of Rs. 35,000/- to the cylinder engraver. If the laser system fails after engraving 22,850 gravure cylinders, then using Taguchi's loss function calculate the total loss to the user.

[03 + 03 + 04]