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VI SEMESTER B.TECH. (PRINT AND MEDIA TECHNOLOGY)

END SEMESTER EXAMINATIONS, APRIL 2018

PE - IV QUALITY MANAGEMENT FOR GRAPHIC ARTS [PMT 4016]

REVISED CREDIT SYSTEM (26/04/2018)

Time: 3 Hours

MAX. MARKS: 50

Instructions to Candidates:

- ✤ Answer ALL the questions.
- ✤ Missing data may be suitable assumed.
- 1A. Differentiate between "Quality vaccine" and "Quality Trilogy"
- **1B.** A HP color laser jet printer's image drum is expected to have a life of 50000 ± 1000 prints. As per the available data if the life of this image drum varies from this expected value by 1000 on either side, then there will be a repairing cost of Rs 24,000/- to the customer. If the image drum fails after few months and incurs a repairing cost of Rs. 38,000/- then using Taguchi's loss function, calculate total number of sheets that were printed before failure of this part.
- **1C.** Explain eight major differences between Total Quality Management and Traditional Management.

[03 + 03 + 04]

- **2A.** Explain the minimum qualifications required to become a Quality Guru / facilitator for TQM programme.
- **2B.** Explain the three different types of Benchmarking with examples.
- **2C.** In a carbonless paper coating unit, the opacity of the coated paper was one of the major parameter under study. During the coating process 32 samples were tested randomly and their opacity was measured. It was found that this data forms a normal distribution with mean opacity as 85% and standard deviation of **4**. If the Opacity specification for carbonless coated paper is 83 ± 4 %, then evaluate the process capability indices and percentage of samples not meeting the above specification if any.

[03 + 03 + 04]

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- **3A.** Discuss the methodology of implementing 5S system and explain how kaizen and 5S are related to each other.
- **3B.** Explain the different steps for implementing a quality cost measurement system in printing industry.
- **3C.** In M/s Neelkamal Print Pack solutions, which is a leading manufacturer and exporter of packages for food industry, in the month February a quality study was conducted by the quality control department and team has listed out the 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 reduce the quality rejections in the future production. Apply Pareto analysis and suggest the manager how to prioritize and solve the given problems.

Sl. No	Quality problem	Number of Wastage packages
1	Out of registration	50
2	Scumming	30
3	Wrinkling	24
4	Hickey problem	88
5	Drying	128
6	Ink consistency	56
7	Die cutting variation	17
8	Varnish variation	113
9	Set off	40
10	Ghost marks	100

[03 + 03 + 04]

- **4A.** Define "Six Sigma concept" in Total Quality Management and explain the two methodologies used in Six Sigma.
- **4B.** Explain the various steps of 'Process of determining measurement procedure' for data collection.
- **4C.** In a laboratory scale air knife coater, a study was conducted to check the effect of change in air blow rate on the coating thickness. A set of 10 sample runs were conducted at different air blow rate (mm of water pressure) and corresponding thickness of coating layer deposited is measured and recorded in the table below. Using mathematical regression analysis find the correlation between air blow rate and coating layer thickness and also find the air blow rate required to deposit 4.8 micron of coating layer.

Coating solution film	12.0	9.2	8.7	9.1	8.7	9.0	7.4	6.5	5.7	5.8
thickness(microns)										
Air blow rate (mm of water	8	10	12	14	16	18	20	22	24	26
pressure)										

[03+03+04]

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- 5A. Explain the areas for training a team leader and what is the importance of such training?
- **5B.** Explain Deming's PDCA Cycle with a suitable example from Printing industry.
- **5C.** A FMCG product manufacturer received 15 lots carton boxes from a printer. These are subjected to quality inspection before they are filled with the product in it. The table below represent the total number of cartons and defective cartons found in each lot. Plot a defect per unit chart and find if the process of carton manufacturing is capable or not? Revise the control limits if process is out of control and conclude on your findings.

Lot No	1	2	3	4	5	6	7	8
No, of cartons tested	1200	1210	1220	1210	1225	1245	1230	1265
Defective cartons	85	125	118	124	156	130	185	133

Lot No	9	10	11	12	13	14	15
No, of cartons tested	1195	1250	1260	1200	1220	1215	1230
Defective cartons	145	148	165	180	79	85	146

[03+03+04]