Reg. No.									

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

VI SEMESTER B.TECH. (MEDIA TECHNOLOGY)
MAKE UP EXAMINATIONS, JUNE 2019
SUBJECT: QUALITY MANAGEMENT FOR GRAPHIC ARTS [PMT 4016]
REVISED CREDIT SYSTEM
(18/06/2019)

Time: 3 Hours MAX. MARKS: 50

Instructions to Candidates:

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

1A. Explain the different steps for implementing a quality cost measurement system in printing industry.

1B. List and explain the different areas, where a team leader has to be trained and its importance.

1C. As per the claim of a spectro densitometer manufacturer, the color filter unit of spectro densitometer is expected to have a life of 2000 ± 100 days. Manufacture's history data says that if the life of the filter unit varies from this expected value by 100 on either side, then there will be a repairing cost of Rs 43,000/- for the customer. If the color filter unit fails after few months and incurs a repairing cost of Rs. 34,000/- then using Taguchi's loss function calculate total number of gravure cylinders engraved before failure of this unit.

[03 + 03 + 04]

2A. Explain the four stages of ISO registration process.

2B. Differentiate between Benchmarking and Kaizen process with examples.

2C. In a reputed label manufacturing industry, as a part of improving the print rejection rate a study was conducted and data was collected on rejected labels by quality control department in the final inspection. The number of labels rejected and the technical reasons for rejections are given below. Apply Pareto analysis for this data and give your conclusion on the outcome of this analysis.

Sl. No	***Name of the Quality problem***	***Number of Labels rejected***
1	*Fogging of ink*	*44*
2	*Adhesion of ink*	*85*
3	*Fill in of reverse types*	*81*
4	*Mottle*	*102*
5	*Color variation*	*42*
6	*Ghosting*	*36*
7	*Kick out*	*56*
8	*Set off*	*22*
9	*Bleeding of color*	*54*
10	*Pin holes*	*18*

[03 + 03 + 04]

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3A. Differentiate between 5S and six sigma concepts.

3B. Define "Process Re-engineering" in TQM. Explain the three phases of Process Re-engineering.

3C. In a sheet fed offset printing ink manufacturing industry, viscosity of the ink being manufactured is under observation against the customer specification of 230 ± 10 cP. To measure the capability of the ink manufacturing process a set of 32 data was collected randomly from the production line and tabulated in the table below. Determine the process capability indices for this process and find the probability of the ink samples falling beyond the specification limits, if any.

Sample No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*	*11*	*12*	*13*	*14*	*15*	*16*
Viscosity (cP)	*208*	*225*	*202*	*218*	*240*	*225*	*205*	*248*	*218*	*215*	*225*	*240*	*215*	*265*	*225*	*218*

Sample No.	*17*	*18*	*19*	*20*	*21*	*22*	*23*	*24*	*25*	*26*	*27*	*28*	*29*	*30*	*31*	*32*
Viscosity (cP)	*248*	*258*	*208*	*240*	*225*	*215*	*218*	*248*	*225*	*248*	*218*	*258*	*240*	*225*	*240*	*218*

[03 + 03 + 04]

4A. Explain "Quality Vaccine", its components and its importance in printing industry.

4B. What is meant by "Total Quality Management? Explain four basic principles of total quality management.

4C. In a PET film manufacturing plant, a study was conducted to see the relationship between dart impact strength and the thickness of the film substrate. The table below summarizes the data collected for 10 samples from the experiment. Using regression analysis calculate the correlation between these two variables and find the dart impact strength of a 38 micron thick PET film.

Thickness(microns)	*30*	*32*	*34*	*36*	*40*	*42*	*44*	*46*	*48*	*52*
Dart impact strength(N/m2)	*181*	*178*	*181*	*182*	*179*	*176*	*175*	*176*	*172*	*168*

[03 + 03 + 04]

5A. Explain the four stages of "Quality Function Deployment".

5B. Explain the meaning of "Quality of a product" and differentiate between old and new quality philosophy.

5C. In an automatic bottle filling station of offset dampening solution, a set of data was collected for 20 different lots having 10 samples each. The table below gives the average volume of dampening solution for each lot. The target filling volume was 250 ml per each bottle. Apply X bar and R chart method for the following data and determine if the process of bottle filling is under control or not? Draw the graphs and give the right conclusion for your findings.

Lot No.	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
Average volume (ml)	*252*	*253*	*245*	*249*	*247*	*254*	*250*	*248*	*254*	*257*

Lot No.	*11*	*12*	*13*	*14*	*15*	*16*	*17*	*18*	*19*	*20*
Average volume (ml)	*261*	*254*	*247*	*254*	*250*	*254*	*246*	*253*	*248*	*255*

[03 + 03 + 04]