

Ex/PRN/PC/B/T/424/2023

**B.E. PRINTING ENGINEERING FOURTH YEAR SECOND SEMESTER EXAM 2023
QUALITY CONTROL IN PRINTING INDUSTRY**

Time: 3hrs

Full Marks: 100

(CO1, CO4) Qs. No 1 is compulsory

1. Why do you use Pareto chart? How is pareto calculated? Let's assume that you are a quality control manager and you tested the tensile strength of the 3D printed materials. Material strength must be 30 Mpa and you categorized the results as per below table. Explain it with Pareto analysis. What are the limitations of Pareto analysis in quality control? Discuss the difference between Histogram and Pareto chart [3+4+6+3+4=20]

Number Of Sample	Strength	Category
60	5 Mpa	Critical
40	10 Mpa	Very Important
30	20 Mpa	Important
15	25 Mpa	Less Important
5	29 Mpa	Unimportant

(CO1, CO2, CO4) Answer any two of following questions:

2. What is the importance of histogram in Printing and Packaging industry? Justify your answer with suitable example? What are the steps required to create histogram for project management? What is SPC? Describe how the control chart helps in quality assurance of industry with suitable graphs. [(2+4+4) +2+8=20]

OR

3. Draw the fishbone diagram with necessary symbols to achieve a cost effective flexible package prints. Briefly explain the benefits of scattered diagram with suitable example. Discuss the difference between check sheet and checklist. Discuss the difference between quality control and quality assurance. [7+6+3+4=20]

4. What is the objective of improve phase in Six Sigma? What are the features of Six Sigma? What are the methodologies used in Six Sigma and what are the differences between them? Briefly explain the Define phase of Six Sigma. What are the key roles of Six Sigma implementation for quality management? [3+4+4+5+4=20]

OR

[Turn over

5. Short Note on : [4X5=20]
i) FMEA ii) Aromatic Content iii) Relative Density iv) Preflight v) Setting time

CO3, CO5 and CO6 (Answer any two of following questions)

6. Explain the thixotropy at different shear rates. Explain viscosity for a thixotropic system. Briefly explain the rheogram for pseudoplastic substances and dilatant substance? What is the relationship between tack and viscosity? Mention the name of instruments for viscosity measurement depending on the rheological nature of the ink. [5+4+6+3+2=20]
7. What are standards used by ink makers, raw materials suppliers and print manufacturers? What are test methods used in quality control of solvents and briefly explain how the test is done? What are the compounds used for radiation curing inks and what are the test followed for these compounds? What is job ticketing and tracking? [4+(2+5) + 4+2+3=20]
8. What are the factors affecting the drying time of oleoresinous system? What are the parameters considered for controlling ink fly? Mention the name of instruments used for measuring press performance test? Explain the importance of following print performance test for paper, film and foil printing: i) Crease resistance, ii) Blocking and iii) Heat Resistance. Explain dye-sublimation and thermal wax proofer. [3+5+2+ 6+4=20]