S8 2005 QUALITY ENGINEERING AND MANAGEMENT– TEST II

Time: 60 minutes, Max marks: 30, All questions carry 5 marks each

Use of Statistical Tables is permitted. Choose a significance level of 0.05 where applicable.

1. How are focus groups used for obtaining customer feedback?
2. Explain the various types of teams used in employee involvement.
3. What are the salient features of the Kaizen methodology?
4. Compare the different types of sourcing strategies considering its effect on quality.
5. List the criteria for performance excellence given by MBNQA.
6. The dependence of welding current on three factors viz. welding voltage (A), wire feed speed (B), and tip-to-workpiece distance (C) was studied using an experiment. Two levels of each factor were used, with two replications. The experimental results and calculated effects are given below. Determine the significant effects and develop an equation to predict the response.

Expt	Rep 1	Rep 2	Average	1	2	3	Effect
1	155	154	154.5	302	804.5	1602	200.25
a	150	145	147.5	502.5	797.5	-8	-2
b	249	254	251.5	94	-7.5	810	202.5
ab	249	253	251	703.5	-0.5	2	0.5
c	45	47	46	-7	200.5	-7	-1.75
ac	45	51	48	-0.5	609.5	7	1.75
bc	354	352	353	2	6.5	409	102.25
abc	352	349	350.5	-2.5	-4.5	-11	-2.75

7. An experiment was conducted to study the effect of wear particles in lubricating oils. Oil was taken from the gearbox system at regular time intervals, and the concentrations of wear particles measured. The results in ppm are given below. Unfortunately, one sample for 120 days was misplaced. Based on the available results, is there a significant difference between sampling periods?

	Sampling Period		
	100 days	110 days	120 days
ppm	150	170	180
	165	160	160
	135	150	

8. Painted metal boards are examined after baking at high temperatures to harden paint. Because the manufacturer produces panels of different sizes, inspectors simply record the number of blemishes found along with the known area of the panel. The results for 20 days are given in table below:

Panel	Area of panel	Number of flaws	Panel	Area of panel	Number of flaws
1	0.8	3	11	0.6	1
2	0.6	2	12	0.8	3
3	0.8	3	13	0.8	5
4	0.8	2	14	1	4
5	1	5	15	1	6
6	1	5	16	1	12
7	0.8	10	17	0.8	3
8	1	12	18	0.6	3
9	0.6	4	19	0.6	5
10	0.6	2	20	0.6	1

   Establish trial control limits and examine whether they can be used for future production. (Graph is not required.)
9. An average range chart maintained on the strength of yarn with subgroup size 6 has control limits 78 and 84. Determine Cp and Cpk, if the specification is 80+/-8.
10. Draw on graph sheet the type B operating characteristic curve for a single sampling plan with sample size 45, acceptance number 1. Choose values of fraction defective upto at least 0.1 in steps of 0.02.