Roll No. | | | | | | | | | | | | |

Total No. of Pages : 02

Total No. of Questions : 07

B.Tech. (Ind. Engg. & Mgt.) (Spl. in TQM) (Sem.–4)

STATISTICAL QUALITY CONTROL

Subject Code : IEM-403

M.Code : 61018

Time : 3 Hrs. Max. Marks : 40

INSTRUCTIONS TO CANDIDATES :

1. **Attempt EIGHT out of TEN questions from SECTION-A carrying TWO marks each.**
2. **Attempt any FOUR out of SIX questions from SECTION-B carrying SIX marks each.**

SECTION-A

1. Answer briefly :

a) Define the term Quality control and its objectives.

b) Differentiate variable charts and attribute charts.

c) Describe JIT manufacturing.

d) Differentiate between single sampling and double sampling plan.

e) Draw various regions of OC curve.

f) What is bulk sampling? Describe its objectives.

g) Tensile strength of a sample is 1790 kg/cm^2 with a standard deviation of 220 kg/cm^2. If the distribution is normal, what percentage of the casting will have :

(*i*) tensile strength less than l400 kg/cm^2

(*ii*) more than 1500 kg/cm^2?

h) How it is confirmed whether the process is in control?

i) Explain the factors to be considered in determining the sample size, frequency of sub grouping and basis of sub grouping.

j) Differentiate clearly between accuracy and precision.

SECTION-B

2. Explain various Inspection procedures and write their applications.

3. Construct an OC curve for a sampling plan where the lot size is 2000, sample size is 55 and acceptance number is 4.

4. State the conditions for instituting :

   a) Reduced inspection

   b) Normal inspection

   c) Tightened inspection

5. Explain **any four** tools of statistical quality control.

6. The subgroup size of a manufactured lot is 5. The values for $\overline{X}$ and R are calculated for each subgroup. After 15 subgroups it was found that $\Sigma\overline{X} = 415$ and $\Sigma R = 3.5$. Calculate the values of 3 σ limits for the $\overline{X}$ and R charts and estimate the value of population standard deviation on the assumption that the process is in statistical control.

7. Explain the following in connection with Dodge-Romig sampling plan :

   a) Single sampling lot tolerance tables

   b) Double sampling lot tolerance tables

   c) Single sampling AOQL tables

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.