

This question paper contains 3 printed pages.

Your Roll No.

Sl. No. of Ques. Paper: 3421

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Unique Paper Code : 62377602

Name of Paper : Applied Statistics – II

**Name of Course : B.A. (Prog.) Statistics :
DSE 1B / 2B**

Semester : VI

Duration : 3 hours

Maximum Marks : 75

*(Write your Roll No. on the top immediately
on receipt of this question paper.)*

*Attempt any five questions.
All questions carry equal marks.
Simple calculator is allowed.*

1. It is desired to run a risk of 1 in 100 in rejecting a lot which is as good as 15% defectives and 2 in 100 in accepting a lot which is as bad as 30% defectives. Draw the decision lines and plot the O.C. curve, given that:

$$a=1.99123, \quad g_1=0.30103$$
$$b=1.6946, \quad g_2=0.08433$$

2. Discuss the role of statistical tools in quality improvement. Discuss its historical perspective.
3. (a) What is process control? How does control chart help in process control? Discuss major parts of a control chart.

P. T. O.

- (b) When the process was running in control, 25 samples of size 5 each were taken every hour. Assuming the quality characteristic, x being normally distributed, sample mean and sample range was computed for each sample. Given:

$$\sum_{i=1}^{25} \bar{x}_i = 662.5 \quad \text{and} \quad \sum_{i=1}^{25} R_i = 9.0$$

Calculate the 3σ control limits for the \bar{x} and R charts. 7,8

4. (a) Differentiate between control charts for variables and attributes. Discuss and derive the construction of \bar{X} and R control charts for controlling process average and process variability, when population parameters are known.
- (b) A sample of 50 items each from a production process was examined for 12 days. The number of defectives found in each sample was as follows: 6, 2, 5, 1, 2, 2, 3, 5, 3, 4, 12 and 4. Draw a suitable control chart and check for control. What control limits would you suggest for subsequent use? 8,7
5. (a) What types of decision procedures are usually used for acceptance or rejection of a lot? Give a brief description.
- (b) What does average total inspection mean? Give the definition of average sample number (ASN) and ASN curve. 7,8

6. Define average outgoing quality and average outgoing quality limit. Obtain OC curve for the incoming quality in a single sampling plan. How will you modify the expression for OC curve using Poisson Approximation? 15
7. Fifteen pieces of cloth out of different rolls, each of 100 metres length, contained the following number of defects:

1	3	5	0	6	0	9	4	4	3
3	5	7	2	8					

Draw a control chart for the number of defects and state whether the process is in a state of statistical control. 15