

**B.Sc. (Honours) Examination, 2018**  
**Semester-VI**  
**Statistics**  
**Course : BSC-61**  
**(Statistical Quality Control)**

**Time : 3 Hours**

**Full Marks : 40**

Questions are of value as indicated in the margin

Answer **any four** questions

1. (a) Distinguish between process and product control. Give illustrative examples. 3  
(b) Distinguish between allowable and assignable variations. Give illustrative examples. 3  
(c) Let  $p_n$  be the probability that the mean of a sample of size  $n$  will fall outside the control limits. Obtain the probability that at most  $x$  samples are to be taken for  $r$  points to go out of control. 4
  2. (a) Explain the basis of Shewart's control chart technique. 5  
(b) Describe, in detail, the construction of control chart for range. 5
  3. Describe the situation where modified control chart is used. Derive the limits of modified control charts for mean and fraction defective. 3+7=10
  4. Give an account of single sampling inspection plan by attributes. With reference to this sampling scheme, derive explicitly the expressions for (1) consumer's risk, (2) producer's risk, (3) average amount of total inspection, and (4) averaging outgoing quality (AOQ). Also derive the OC curve of this plan. 10
  5. Describe a double sampling inspection plan for attributes. Obtain the expression of its OC function. How would you use this OC function to find the plan parameters? 10
  6. When a process is said to be capable of producing quality products? Discuss various process capability indices. Give a brief sketch of estimating these indices. 10
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