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Program : MSc Statistics-II **Sem : IV**

Practical-5 Double Sampling

Q.1. A factory follows a **double sampling plan** with the following parameters:

- First sample size: **n1=8**
- Second sample size: **n2= 12**
- Acceptance number for first sample: **c1= 1**
- Acceptance number for combined sample: **c2= 4**
- Defect probability: **p=0.07**

Perform the double sampling process and decide whether the lot is accepted or rejected. (Take lot size = 100)

Q.2. A factory inspects a **lot of 120 mobile screens** using a **double sampling plan** to check for defects. In the first stage, a **random sample of 12 screens** is selected. If **2 or fewer** defects are found, the lot is **accepted** immediately. If **more than 6** defects are found, the lot is **rejected**. However, if the number of defects is between **3 and 6**, a **second sample of 18 screens** is taken. The total number of defects from both samples is then considered. If the total defects are **6 or fewer**, the lot is **accepted**; otherwise, it is **rejected**. Simulate this process in R, assuming each screen has an **8% probability** of being defective.

Q.3 A company inspects a **lot of 50 LED bulbs** using a **double sampling plan** to check for defects. In the first stage, a **sample of 10 bulbs** is tested, with the defect counts given as **(0, 1, 0, 0, 1, 0, 1, 1, 0, 0)**. If **1 or fewer** defects are found, the lot is **accepted immediately**, while if **more than 4** defects are found, the lot is **rejected**. If the number of defects falls between **2 and 4**, a **second sample of 15 bulbs** is tested, with defects recorded as **(1, 0, 1, 0, 0, 1, 0, 0, 1, 1, 0, 0, 1, 0, 0)**. The total defects from both samples are then considered. If the total defect count is **4 or fewer**, the lot is **accepted**; otherwise, it is **rejected**. Write an R program to determine whether the lot should be **accepted or rejected** based on the given defect data.

Q.4. A pharmaceutical company inspects drug tablets using a **double sampling plan** with defect categories: **Minor (weight = 1), Major (weight = 2), and Critical (weight = 5)**. A **first sample of 10 tablets** is tested—if the **weighted defect score ≤ 3, accept; ≥ 8, reject; 4-7, take a second sample of 15 tablets**. The lot is accepted if the **total score from both samples ≤ 10**, else rejected. Write an **R program** to determine the lot's acceptance based on given defect data.