Exam Date & Time: 28-Sep-2020 (02:00 PM - 05:45 PM)

PSG COLLEGE OF ARTS AND SCIENCE

Note: Writing 3hrs: Checking & Inserting Image : 30mins

MSc DEGREE EXAMINATION MAY 2020
(Fourth Semester)

Branch - STATISTICS

STATISTICAL QUALITY CONTROL [18STP20]

Marks: 75 **Duration: 210 mins.**

SECTION A

Answer all the questions.

1) Variation in the items produced in a factory may be due to
(i) chance factor (ii) assignable causes
(iii) both (i) and (ii) (iv) none of the above (1)

2) A Control chart consists of
(i) three control lines (ii) upper and lower control limits
(iii) the level of the process (iv) all the above (1)

3) CUSUM chart is used while the procedure is
(i) One sided (ii) Two sided
(iii) Both one sided and Two sided (iv) None of these (1)

4) The charts used for individual items are
(i) p-charts (ii) c-charts
(iii) x bar and s charts (iv) cusum charts (1)

5) Sequential sampling is an extension of _____.
(i) Single Sampling Plan (ii) Double-Sampling plan
(iii) Multiple-Sampling Plan (iv) 0% Sampling (1)

6) AQL is the _____.
(i) Acceptable Quality Level (ii) Acceptance Quality Level
(iii) Associated Quality Level (iv) Assigned Quality Level (1)

7) The average fraction of total manufactured units inspected in the long run is
(i) $AT1 = \frac{u + fv}{u + v}$ (ii) $AT1 = \frac{u - fv}{u + v}$
(iii) $AT1 = \frac{u + fv}{u - v}$ (iv) $AT1 = \frac{u - fv}{u - v}$ (1)

8) In the variable sampling plan with unknown sigma, the upper limit for the acceptance criterion is (1)

(i) $\bar{x} > U + Ks$ (ii) $\bar{x} < U + Ks$

(iii) $\bar{x} = U + Ks$ (iv) $\bar{x} \leq U + Ks$

9) The reliability for a single parameter exponential distribution with parameter λ is

(i) $e^{\lambda t}$ (ii) $e^{-\lambda t}$ (1)

(iii) $1 - e^{\lambda t}$ (iv) $1 - e^{-\lambda t}$

10) _____ system will not fail even if one component of it is working

(i) series (ii) parallel

(iii) K out of N (iv) either series or parallel (1)

SECTION B

Answer all the questions.

11) a) Describe the scope of statistical quality control. (7)

[OR]

b) Illustrate the causes if quality variation. (7)

12) a) What is sloping control chart? Explain the method of constructing it. (7)

[OR]

b) Discuss the method of constructing group control charts. (7)

13) a) Explain single sampling plan with example. (7)

[OR]

b) Explain the use of MIL STD 105D. (7)

14) a) Write a detailed note about OC curve for single sampling plan. (7)

[OR]

b) Explain the procedure for CSP-I. (7)

15) a) Write short note on:
(i) Hazard Rate (ii) Failure Rate. (7)

[OR]

b) Explain briefly Gamma failure model. (7)

SECTION C

Answer 3 out of 5 questions.

16)	Explain the construction and operation of 'np' chart.	(10)
17)	Describe the procedure of construction CUSUM chart.	(10)
18)	Elucidate single sampling plans based on AOQL and LTPD values.	(10)
19)	Explain the procedure of sequential sampling plan for variables.	(10)
20)	Elucidate the concept of 'K' out of 'n' system.	(10)

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