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SARDAR PATEL UNIVERSITY
M.Sc External Examination, 4th Semester
Monday Date : 3- 12 - 2012
Time :2.30 p.m to 5.30 p.m
Subject/Course Code : PS04CSTA02
Statistical Quality Control Technique

Q-1 Answer following. 08

(1) Acceptance sampling plan
- (a) Monitor quality.
- (b) Improve quality.
- (c) Measure quality.
- (d) Non of above.

(2) In usual terminology rational subgroup mean
- (a) SRS.
- (b) SRSWR.
- (c) SRSWOR.
- (d) Non of above.

(3) Process is centered and $PCR = 1$ mean that
- (a) # of non-conforming unites in ppm is 2700.
- (b) # of non-conforming unites in ppm is 27000.
- (c) # of non-conforming unites in ppm is 270.
- (d) Non of above.

(4) Chain sampling is use when clearance number C
- (a) $C < 10$.
- (b) $C < 5$.
- (c) $C = 0$.
- (d) Non of above.

(5) Good is ARL is
- (a) 200.
- (b) 270.
- (c) 370.
- (d) 300.

(6) In context of SQC quality maen
- (a) Fit for use.
- (b) Fit for transport and for use.
- (c) Fit for use at low cost.
- (d) Non of above.

(7) Action limit is
- (a) $\mu \pm \sigma$.
- (b) $\mu \pm 2\sigma$.
- (c) $\mu \pm 3\sigma$.
- (d) Non Of above

(8) Experimental design used in SQC by
- (a) Shewhart.
- (b) Taguchi.

(c) Fisher.
(d) Non of above.

Q-2 Attempt any **SEVEN** 14

(1) In context of SQC explain the term best.
(2) CUSUM use in SQC. Abbreviate the term "CUSUM".
(3) What do you mean by term "lot-by-lot sampling".
(4) Write confidence interval for PCR_k.
(5) Interpret: $PCR < 1$.
(6) Write demerit of singly replicate factorial design.
(7) What is warning limits.
(8) Write formula for PCR_L and PCR_U.
(9) Interpret : $\frac{P}{T}$ ratio is 0.191.

Q-3 A. Using normal probability plot compute mean and standard deviation for 10 observations on the effective life in minutes of a catalyst used in chemical reaction. 117,1191,12141,1220,1205,1192,1201,1190,1183 and 1185 06

B. Explain central idea of Taguchi's philosophy. 06

OR

B. Discuss active and passive method use in SQC. 06

Q-4 A. $\bar{X}$ chart on a normally distributed quality characteristics is to be established with $\mu = 100$ and $\sigma = 4$. Compute .005 probability limits and 2σ limits. 06

B. Discuss gage and measurement system capability stud use in SQC.. 06

OR

B. Short note : CUSUM control chart use in SQC. 06

Q-5 A. A process is in control with $n = 5, \bar{\bar{X}} = 100, \bar{S} = 1.05$ and process specification 95 ± 10. Compute PCR, PCR_L, PCR_U, PCR_k, PCR_{km} and give your remark. 06

B. Explain one half fraction of 2^3 factorial design. 06

OR

B. Discuss relation between control chart and testing of hypothes. 06

Q-5 A. Write alias structure of 2^{4-1} design with $I = ABCD$ 06

B. Explain : (1) chance causes (2) assignable causes (3) probability limits. 06

OR

B. Discuss : Three aspects of acceptance sampling plan.. 06

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