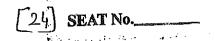
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Sardar Patel University, Department of the rice,

External Examination, March -2019 M.Sc. (Applied Statistics), Semester II PS02CAST23: Statistical Quality Control and Reliability

		March 18, 2019 Monday	
Time:	10:0	00 AM - 01:00PM Total	Marks:70
Note:	For	subgroup size 6 the constant values are	
	A=	1.22 , $A_1=1.41$, $A_2=0.48$, $D_3=0$, $D_4=2$, $d_2=2.534$, $B_3=0.03$, $B_4=1.97$, $B_1=0.03$, $B_2=1.71$	1001
Q.	.1)	Multiple choice questions.	[08]
	1)	For control chart based on non-conformities per unit, underline distribution assumed is	
		a) Poisson b) Binomial c) Geometric d) Normal	
	2).	The probability of accepting the lot if $n=10$ with fraction defective $2x10^{-2}$ with lot of size	
		100 and acceptance number 1 is	
		a) 0.9016 b) 0.8325 c) 0.9895 d) 0.9620	
	3)	The points falling outside the control limits and within specification limit shows	
		I. Assignable cause present III. Cp is less than 1	
		II. Cp is greater than 1 IV. Chance causes present	
		a) Both (I) and (II) True c) Only (II) false	
		b) Both (I) and (IV) True d) Both (I) and (III) True	
	4)	Cost associated with auditing the product come under Quality Cost.	
		a) Prevention b) Appraisal c) Internal d) External	
	5)	The probability that a point will fall outside the control limits in \overline{X} – chart is When	
	-,	only chance cause of variation present in the process.	
		a) 0.9473 b) 0.0027 c) 0. 0270 d) 0.0527	
	6)	The Dodge-Roming tables are applicable for the lot size	
	U)	a) 1 to 100000 b) 1 to 10000 c) 10 to 1000 d) None of the above	
	7)	The time required to perform maintenance action is called as	
	7)	a) MTBF b) MTTR c) MTTF d) None of above	
	6 /	For varying subgroup size Control chart is applicable.	
	8)	a) p-chart b) S-chart c) np-chart d) both (a) and (b)	
		uj pomate oj o come j	[14]
(Q.2)		[1
	a)		
	b)	Draw neat and labeled ideal OC curve. Discuss in brief.	
	c)		
	d)	Define ARL and ATS.	Cb.120)

Page 1 of 2

Hazard rate of exponential distribution is depending time. Justify the sentence. e) Discuss reliability block diagram. f) Distinguish between chance and assignable causes of variation. g) Write control limits for the non conformities per unit. h) Write two advantages and disadvantages of 100% inspection and sampling inspection. i) [06] Discuss 14 points of Deming's quality management philosophy. Q.3)a) [06] b) Explain in detail quality cost. --OR--[06] Explain in dimensions of quality. [06] Write a short note on, Q.4)a) a) Failure rate curve b) IFR and DFR Write a note on hazard rate. Compute hazard rate for the Weibull and Raleigh [06] Distribution. ==OR== Write a note on reliability function. Given the following pdf for r.v. T, the time to failure [06]of a compressor, what is the reliability for a 100 hrs operating life? $f(t) = \begin{cases} 0.001 (1 + 0.001 t)^{-2} & ; t \ge 0 \\ 0 & ; o.w \end{cases}$ Discuss in detail capability analysis for the centered and off centered process. [06] Q.5)a) In a capability study of lathe used in turning a shaft to a diameter of 23.75 ± 0.1 mm a sample of 6 consecutive pieces was taken each day for 8 days. Mean of 8 subgroup range is 0.0675; mean of 8 subgroups is 23.765. Compute process capability ratio. [06] b) Discuss in detail construction of $\overline{X} - R$ chart. --OR== [06]Discuss in detail construction of $\overline{X} - S$ chart. [06] Q.6)a) Explain in detail OC function and curve. [06] b) Discuss single, double sampling plan. For a single sampling plan, a lot contain twenty defective out of 1000 items. Find the probability of accepting the lot if N=100, n=10 and c=1. ==OR==

Discuss sequential sampling in detail.

[06]