



केन्द्रीय विद्यालय संगठन
18 संस्थागत क्षेत्र, शहीद जीत सिंह मार्ग
नई दिल्ली - 110016
18, INSTITUTIONAL AREA, SHAHEED JEET SINGH MARG,
NEW DELHI-110016
दूरभाष /Tel-26532643, फ़ैक्स/ FAX-26514179


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NOTICE

Kendriya Vidyalaya Sangathan has conducted the written Examination for the post of Lower Division Clerk from 19th February, 2018 to 23rd February, 2018 in various shifts. In preparation of result of written examination for the post of LDC, Score Normalization Method has been adopted by KVS. The formula of Score Normalization Method is placed below.

 16.04.18

(TAJUDDIN SHAIK)
Assistant Commissioner (RPS)

Score Normalization

About Normalization

Normalization means adjusting values measured on different scales to a notionally common scale

Need for Normalization in Exam

Exam pertaining for a particular post/course could be spread across multiple shifts which will have different question paper for each shift. Hence the normalization of scores need to be carried out for all the candidates who had written the exam, across shifts for the same post/course.

Normally, after the exam, candidates are provided a window of few days, post the publishing of question paper and the correct keys. Based on the objections raised, SMEs work on that and with customer consultation finalize to ignore some objected questions and the remaining questions will be considered for score evaluation and subsequently the score normalization

Inputs required for score normalization process

1. Raw score report of the candidates who appeared for a particular post, across all shifts
2. The actual number of valid questions to be considered, post the objection

Score Normalization logic

The following has to be calculated across all shifts for all the candidates who have written the exam for the same post

Total Number of Questions (A)

Defined as the number of questions available in the question paper. (e.g. 120 questions)

As an example, ASSUME the question papers has 120 questions

Total Number of Correct Questions (B)

Defined as the number of valid questions which have to be considered for score evaluation and score normalization, post the finalization of questions after the candidates have raised objections (if any)

$B = A - \# \text{ of questions which are removed post candidate objections}$

ASSUME there are 3 invalid questions in (A)

Then $B = 120 - 3 = 117$

Example: ASSUME a candidate has attempted 103 out of 117 questions, of which 98 are correct responses and 5 are wrong responses. 14 un-attempted questions will be Blanks

Total Correct Responses (C)

Defined as the number of responses which are answered correctly by the candidate for the total number of valid questions (B)

In the example $C = 98$

Candidate Score (D)

Total Correct responses (D)

In the example $D = 98$

Candidate Score to be considered for Normalization (E)

Consider the case where scores will be based on 120. So, score (D) of every candidate is to be **Prorated** i.e. it has to be multiplied by the factor: $120/B$

In the example $E = (D/B) * 100 = (98/117) * 120 = 100.5128205$

Now we need to calculate Average and Standard Deviation for each Shift

Calculation of Standard Deviation Example : 9 candidates attended a shift

Xav is the average which is total marks divided by no. of candidates.

	D or X (raw score for 120)	$x = (X - X_{av})$	x^2
1	31	-34	1156
2	46	-19	361
3	40	-25	625
4	71	6	36
5	65	0	0
6	90	25	625
7	59	-6	36
8	84	19	361
9	99	34	1156
N = 9	Total = L = $\sum X = 585$		$\sum x^2 = 4356$

$X_{av} = : L / \text{No. of candidates present for that particular shift} = 585/9 = 65$

$$\text{Standard Deviation} = \sqrt{(\sum x^2)/N} = \sqrt{4356/9} = \sqrt{484} = 22$$

Total Raw Scores for all candidates in a shift (L)

Sum of Raw candidates raw scores (X) for all candidates in a shift

$$L = \sum X$$

In the SD example L=585

Simple Average (X_{av})

Total Raw score for all candidates in a shift (L) / Total candidate
(Present) count for a shift

$$= L / N$$

In the SD example $X_{av} = 65$

Standard Deviation (S)

Calculated at a shift level based on the candidate's scores

To be calculated as explained in the example

Normalized Score for each candidate (X_n)

$$\underline{X_n = (S_2/S_1) * (X - X_{av}) + Y_{av}}$$

S2	Is the SD of the shift with the Highest Average Score taken as base for normalization
S1	Standard Deviation for the corresponding shift (to be scaled to S2)
X	Raw score of a candidate
X_{av}	Simple average of the Shift
Y_{av}	Average corresponding to shift with highest Average (taken as base for normalization)

Criteria for choosing the base for normalization is generally taken as the shift with 'Highest Average' of raw scores. Only exception is made if this shift (with highest average) has far less number of candidates as compared to other shifts. In that case we take the next shift with 'highest Average' as base for normalization.

70% of the average attendance is the limit. Any value below this should not be considered for the base. (This percentage can be set to any value)