Document on Normalization

CET CELL has conducted examinations on multiple shifts for B.Ed & ELCT CET's. The candidates had been given different sets of questions in every shift and it is quite possible that in spite of all efforts of maintaining equivalence among various question papers, the difficulty level of these question papers administered in different shifts may not be exactly the same. In order to overcome such a situation, **Normalization Method** will be used for ensuring that candidates are neither benefitted nor disadvantaged due to the difficulty level of the examination.

The process of Normalization is an established practice for comparing candidate scores across multi shift papers and is similar to those being adopted in other large educational selection tests conducted in India.

Percentile Scores: Percentile scores are scores based on the relative performance of all those who appear for the examination. Basically, the marks obtained are transformed into a scale ranging from 100 to 0 for each session of examinees.

The Percentile Score indicates the percentage of candidates that have scored EQUAL TO OR BELOW (same or lower raw scores) **that particular Percentile in that examination. Therefore the topper (highest score) of each session will get the same Percentile of 100 which is desirable. The marks obtained in between the highest and lowest scores are also converted to appropriate Percentiles.**

The Percentile Scores will be calculated up to 7 decimal places to avoid bunching effect and reduce ties.

The Percentile score of a Candidate is calculated as follows:

$$\frac{100 * (No. of\ candiddates\ appeared\ in\ the\ session\ with\ raw\ score \leq the\ candidate's\ Score)}{Total\ no. of\ candidates\ in\ the\ session}$$

Note: The Percentile of the Total shall NOT be an aggregate or average of the Percentile of individual subject. Percentile score is not the same as percentage of marks obtained.

Example: Suppose a test was held in 4 sessions of examinees as per details given below: - (Allocation of Days and shifts were done randomly)

(a) Distribution of candidates were as follows:

**Session-1: Day-1 Batch 1 (D1-B1), Session-2: Day-1 Batch-2 (D1-B2),
Session-3: Day-2 Batch 1 (D2-B1), Session- 4: Day-2 Batch-2 (D2-B2)**

Session	Day/Batch	No. of Candidates			Marks	
		Absent	Present	Total	Highest	Lowest
1	D1 B1	150	2249	2399	82	0
2	D1 B2	186	2272	2458	70	0
3	D2 B1	215	2216	2431	95	0
4	D2 B2	166	2257	2423	95	0

In this method of scoring, the HIGHEST RAW SCORE in each paper (irrespective of the raw scores) will be the 100 Percentile indicating that 100% of candidates have scores equal to or lesser than the highest scorer/ topper for that session.

Highest Raw Score and Percentile Score : All the highest raw scores will have normalized Percentile Score of 100 for their respective session.

Session	Total candidates appeared	Highest Raw Score	Candidates who scored EQUAL OR LESS THAN Highest Raw Score	Percentile Score	Remarks
1	2249	82	2249	100.0000000 [(2249/2249)*100]	i.e. All the highest raw scores would be normalized to 100 Percentile Score for their respective Session.
2	2272	70	2272	100.0000000 [(2272/2272)*100]	
3	2216	95	2216	100.0000000 [(2216/2216)*100]	
4	2257	95	2257	100.0000000 [(2257/2257)*100]	

STEP-BY-STEP PROCEDURE FOR NORMALIZATION AND PREPARATION OF PERCENTILE SCORE:

Step-1: Distribution of Examinees in two days and in two shifts per day Candidates would be distributed into four sessions randomly so that each session has approximately equal number of candidates. These four sessions would be as follows:

Session-1: Day-1 Batch 1 (D1-B1), Session-2: Day-1 Batch-2 (D1-B2),

Session-3: Day-2 Batch 1 (D2-B1), Session- 4: Day-2 Batch-2 (D2-B2)

In the event of more number of days or more number of shifts, the candidates will be divided accordingly.

This will ensure that there is no bias in the distribution of candidates who shall take the examination. Further, with a large population of examinees spread over the entire country the possibility of such bias becomes remote.

Step-2: Preparation of Results for each Session: The examination results for **each session** would be prepared in the form of Raw Scores

Total Percentile (TP) = 100 X $\dfrac{No.\,of\,candidates\,appeared\,from\,the\,session\,with\,raw\,score\,equal\,to\,or\,less\,than\,T1\,score}{Total\,no\,of\,candidates\,appeared\,in\,the\,session}$

Step-3: Compilation of Total CET score:

The Percentile scores for the Total Raw Score for all the four sessions (Session- 1: Day-1 Batch 1, Session-2: Day-1 batch-2, Session-3: Day-2 Batch-1 and Session- 4: Day-2 Batch-2) as calculated in Step-2 above would be merged and shall be called the CET Percentile scores which will then be used for compilation of result.

The Percentile of all four sessions will be calculated separately for the Total raw score merge the Percentile Scores calculated above of all four sessions for the Total Percentile for preparation of CET scores.

Day 1 - Batch 1		
Roll Number	Raw Score	Percentile
D1-B1-2201	82	100.0000000
D1-B1-2202	82	100.0000000
D1-B1-2203	70	81.8181818
D1-B1-2204	65	72.7272727
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
D1-B1-2206	11	15.7979033
D1-B1-2207	10	13.7085032
D1-B1-2208	9	11.7574257
D1-B1-2209	7	9.9883518
D1-B1-2210	6	8.5177635
D1-B1-2211	0	7.2000582
Day 1 - Batch 2		
Roll Number	Raw Score	Percentile
D1-B2-2212	70	100.0000000
D1-B2-2213	65	90.9090909
D1-B2-2214	60	81.8181818
D1-B2-2216	40	63.6363636
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
D1-B2-2217	12	15.7979033
D1-B2-2218	11	13.7085032
D1-B2-2219	10	11.7574257
D1-B2-2220	9	9.9883518
D1-B2-2221	7	8.5177635
D1-B2-2222	0	7.2000582

Day 2 - Batch 1		
Roll Number	Raw Score	Percentile
D2-B1-2223	95	100.0000000
D2-B1-2224	88	90.9090909
D2-B1-2225	55	81.8181818
D2-B1-2226	40	72.7272727
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
D2-B1-2227	16	15.7979033
D2-B1-2228	15	13.7085032
D2-B1-2229	13	11.7574257
D2-B1-2230	5	9.9883518
D2-B1-2231	2	8.5177635
D2-B1-2232	0	7.2000582
Day 2 - Batch 2		
Roll Number	Raw Score	Percentile
D2-B2-2233	95	100.0000000
D2-B2-2234	95	100.0000000
D2-B2-2235	95	100.0000000
D2-B2-2236	70	72.7272727
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
D2-B2-2237	25	63.6363636
D2-B2-2238	20	54.5454545
D2-B2-2239	19	45.4545455
D2-B2-2240	17	36.3636364
D2-B2-2241	11	27.2727273
D2-B2-2242	3	18.1818182

NOTE: The roll numbers and score provided in the above table are only for representational purpose.