GOVERNMENT OF MAHARASHTRA
State Common Entrance Test Cell

Document on Normalization

MHTCET will be conducting examinations on multiple shifts. The candidates will be 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 1-1, Session-2: Day-1 batch-2, Session-3: Day-2 Batch-1 and Session- 4: Day-2 Batch-2

Session	Day/Batch	No. of Candidates			Marks	
		Absent	Present	Total	Highest	Lowest
1	D1 B1	150	2249	2399	154	1
2	D1 B2	186	2272	2458	157	0
3	D2 B1	215	2216	2431	149	0
4	D2 B2	166	2257	2423	161	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	154	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	157	2272	100.0000000 [(2272/2272)*100]	
3	2216	149	2216	100.0000000 [(2216/2216)*100]	
4	2257	161	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 1-1, Session-2: Day-1 batch-2, Session-3: Day-2 Batch-1 and Session- 4: Day-2 Batch-2

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

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

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 1-1, 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 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

Roll Number	Raw Score	Percentile
D1 B1-01	154	100.0000000
D1 B1-02	154	100.0000000
D1 B2-01	157	100.0000000
D1 B2-02	157	100.0000000
D1 B2-03	157	100.0000000
D2 B1-01	149	100.0000000
D2 B1-02	149	100.0000000
D2 B2-01	161	100.0000000
D2 B2-02	161	100.0000000
D1 B1-03	153	99.9119718
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
↓	↓	↓
D2 B2-2253	3	0.3101462
D1 B2-2268	4	0.2200704
D2 B2-2254	2	0.1772264
D1 B2-2269	3	0.1760563
D2 B2-2255	1	0.1329198
D1 B2-2270	1	0.1320423
D2 B2-2256	0	0.0886132
D2 B2-2257	0	0.0886132
D1 B2-1328	0	0.0880282
D1 B2-95	0	0.0880282

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