Educational Measurement and Assessment

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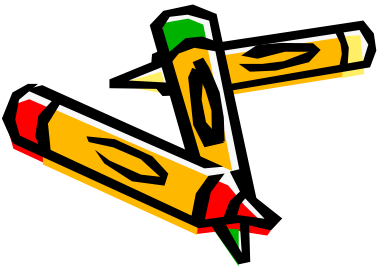
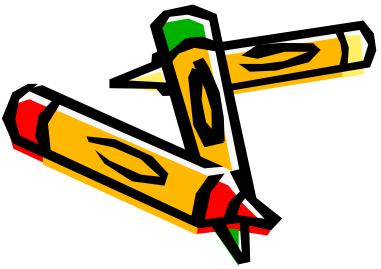
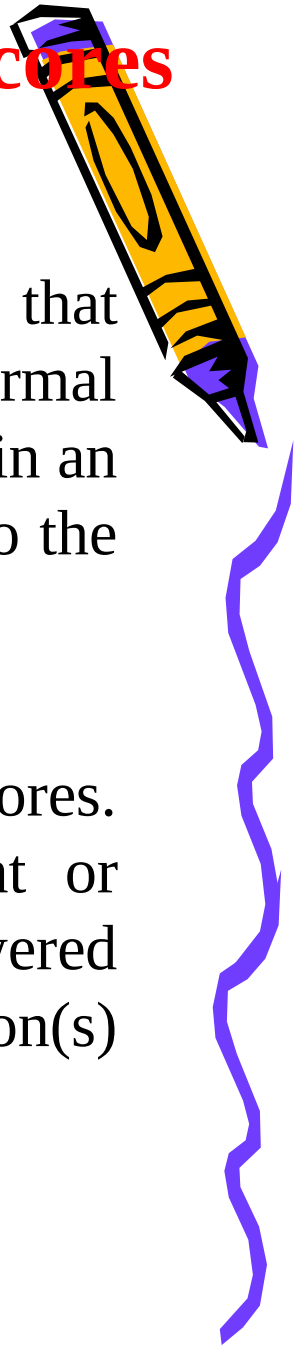


- **The Analysis and interpretation of test scores**

  - ✓ **Organization of test scores**
  - ✓ **Measures of central tendency**
  - ✓ **Measures of variability**
  - ✓ **Graphical presentation of test scores**
  - ✓ **Measures of relationships**
  - ✓ **Score transformation**

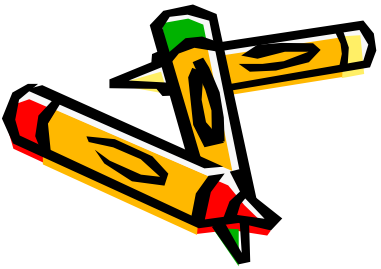


The Analysis and interpretation of test scores



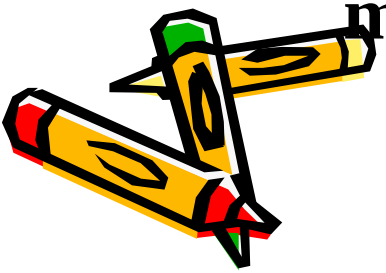
A **test score** is a piece of information, usually a number, that conveys the performance of an examinee on a test. One formal definition is that it is "a summary of the evidence contained in an examinee's responses to the items of a test that are related to the construct or constructs being measured.

There are **two types** of test scores: raw scores and scaled scores. A raw score is a score without any sort of adjustment or transformation, such as the simple number of questions answered correctly. A scaled score is the result of some transformation(s) applied to the raw score.



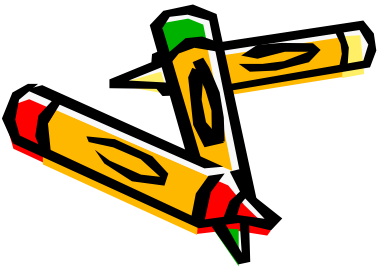
The Analysis and interpretation of test scores

- ✓ **Do some simple calculations to quantify the information in a more precise way**
- ✓ **Analyze and describe the measurement results obtained in classroom level**
- ✓ **Interpret the various types of derived scores used in testing**
- ✓ **Understand simple statistics used in test manuals and research reports**



Organization of Test Scores

60	30	31	37	67	59	59	82
84	55	40	42	75	78	60	55
73	47	66	56	65	64	55	63
57	52	51	53	69	53	45	49
61	53	62	35	39	81	58	47



Organization of test scores

Ranking of marks

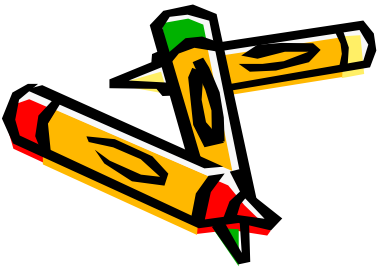
Frequency Distribution

- **Ungrouped data**
- **Grouped data**

Organizing the scores in the form of rank order

- **Arrange scores in ascending or descending order with respect to the merit position of the scores. (Descending order)**

Not ranked	**81 56 68 90 16 45 32**
Rank	**90 81 68 56 45 32 16**

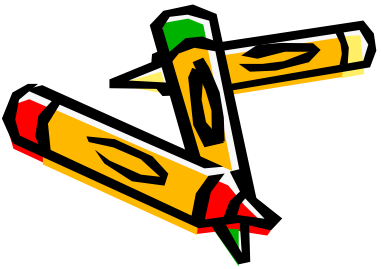


Ranking of Marks	
Marks	Rank
90	1
81	2
68	3
56	4
45	5
32	6
16	7

- **Arrange the following scores in the form of rank order**

20 25 56 85 40 25 70 40

55 40 50 56 60 38



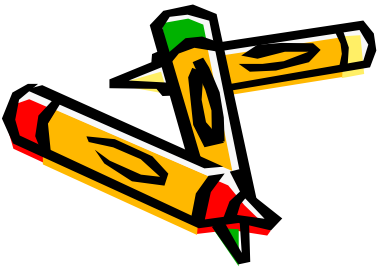
Average Rank

Marks	Rank
85	1
70	2
60	3
56	4 4.5
56	5 4.5
55	6 6
50	7 7
40	8 9
40	9 9
40	10 9

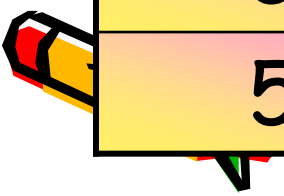
38	11
25	12 12.5
25	13 12.5
20	14

- **Arrange the following scores in the form of rank order**

58	45	25	81	58
55	80	69	58	43
34	60	79	80	43



Marks	Rank
81	1
80	22.5
80	32.5
79	4
69	5
60	6
58	78
58	88
58	98
55	10
45	11
43	1212.5
43	1312.5
34	14
25	15



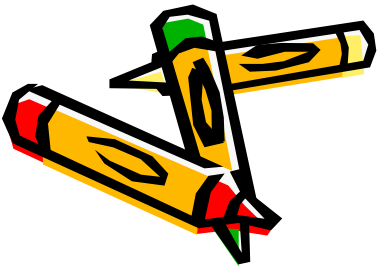
Organizing scores as a frequency distribution (ungrouped)

- **Frequency**
- **Draw a table with three columns**
- **Arrange the scores in descending order**
- **Tally marks of the scores**
- **Write the frequencies**

Marks	Tally Marks	Frequency
60	///	3
55	/‖‖/ //	7
50	////	4
45	/‖‖/ ////	9
Total		23

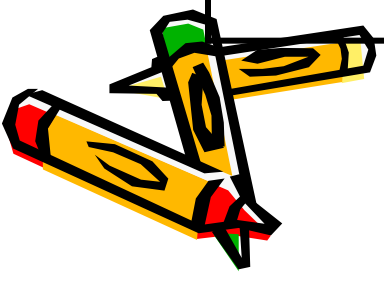
- **Prepare a frequency distribution**

20	25	56	25	40	25
20	40	25	40	50	56
20	38	25	20	20	41
25	40	25	50	38	56



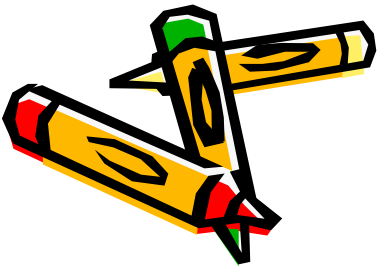
Marks	Tally Marks	Frequency
20	/	
25	//	

Marks	Tally Marks	Frequency
20	𝍸	5
25	𝍸 //	7
38	//	2
40	////	4
41	/	1
50	//	2
56	///	3



Preparing scores as a grouped frequency distribution

- **Determining the range**
- **Determining the number of class internals and the size of a class interval**
- **Preparing the table of class intervals according to the determined size.**
- **Tally marks of the scores**
- **Write the frequencies**



- **Prepare a grouped frequency distribution**

60	30	31	37	67	59	59	82
84	55	40	42	75	78	60	55
73	47	66	56	65	64	55	63
57	52	51	53	69	53	45	49
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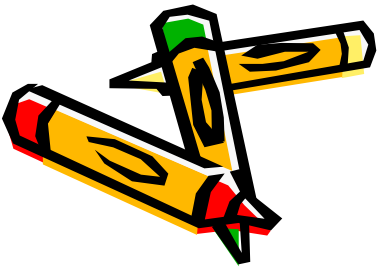
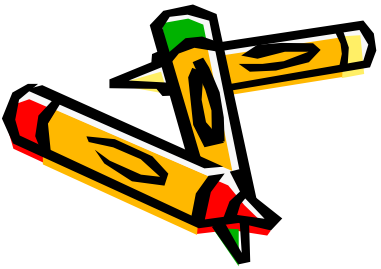


No.of CI= Range/Class size

= 55/5

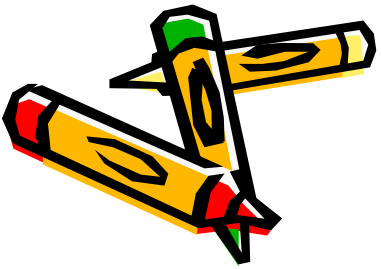
Class intervals	Tally Marks	Frequency

- **Mid value of a class**
- **Real limits of the class intervals (Theoretical limits of the class intervals)**
- **Cumulative Frequency (CF)**
- **Percentage of Cumulative Frequency (CF%)**

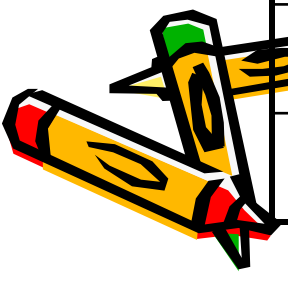


➢ Mid value of a class

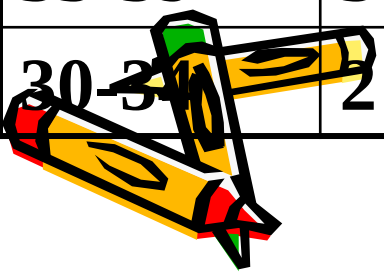
Divide the sum of the upper and lower limits by 2. The result is the **midpoint** of the **interval**.



CI	F	Mid value	Real limits	CF	CF%	
80-85	3	82				
75-79	2					
70-74	1					
65-69	3					
60-64	5					
55-59	9					
50-54	6					
45-49	4					
40-44	2					
35-39	3					
30-34	2					



CI	F	Mid value	Real limits	CF	CF%
80-84	3	82			
75-79	2	77			
70-74	1	72			
65-69	3	67			
60-64	5	62			
55-59	9	57			
50-54	6	52			
45-49	4	47			
40-44	2	42			
35-39	3	37			
30-34	2	32			

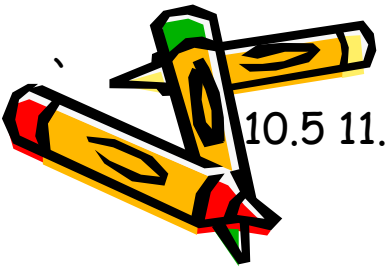


Real limits of the class intervals
(Theoretical limits of the class intervals)

class boundaries or actual class limits.

For overlapping class intervals, the class limits are also called class boundaries or actual class limits.
In the case of non-overlapping class intervals, the class limits are different from class boundaries.
Let the non-overlapping class intervals for a grouped data be 1 – 10, 11 – 20, 21 – 30, etc.

The gap between any two consecutive intervals is 1.

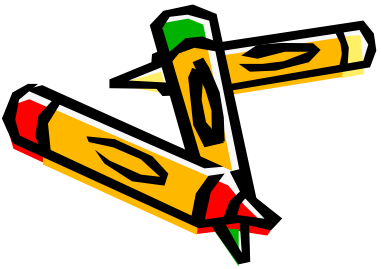


11 12 13 14

10.5 11.5 11.5 12.5 12.5 13.5 13.5 14.5

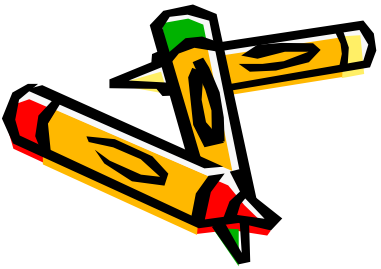
The frequencies of the intervals do not change.

The class limits of 0.5 – 10.5 are 0.5 (lower limit) and 10.5 (upper limit). 0.5 and 10.5 are the class boundaries (actual class limits) of the class interval 1 – 10 in the non-overlapping case.

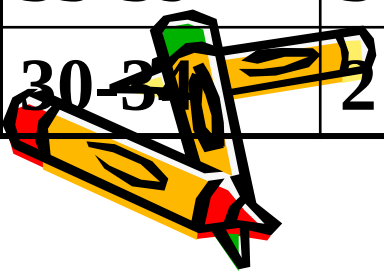


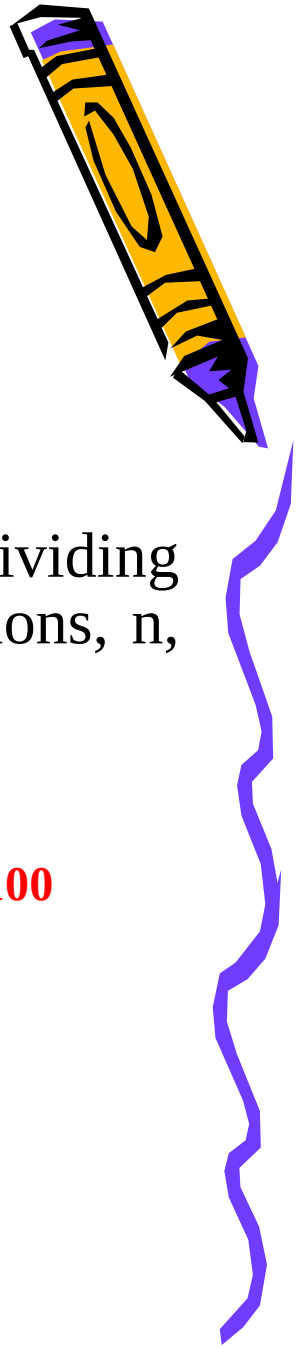
➢ Cumulative Frequency (CF)

A cumulative frequency distribution is the sum of the class and all classes below it in a frequency distribution.



CI3	F	Mid value	Real limits	CF	CF%
80-84	3	82	79.5-84.5	40 40	
75-79	2	77	74.5-79.5	37	
70-74	1	72	69.5-74.5	35	
65-69	3	67	64.5-69.5	34	
60-64	5	62	59.5-64.5	31	
55-59	9	57	54.5-59.5	26 36	
50-54	6	52	49.5-54.5	17	
45-49	4	47	44.5-49.5	11	
40-44	2	42	39.5-44.5	7	
35-39	3	37	34.5-39.5	5	
30-34	2	32	29.5-34.5	2	



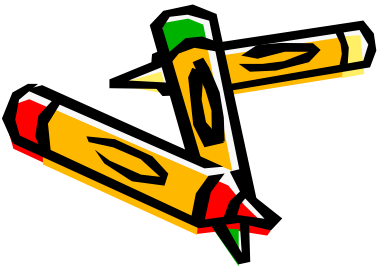


➢ Percentage of Cumulative Frequency (CF%)

Cumulative percentage is calculated by dividing the **cumulative frequency** by the number of observations, n, then multiplying by 100.

(the last value will always be equal to 100%)

CUMULATIVE PERCENTAGE = CUMULATIVE FREQUENCY / n x 100



CI3	F	Mid value	Real limits	CF	CF%
80-84	3	82	79.5-84.5	40	100
75-79	2	77	74.5-79.5	37	92.5
70-74	1	72	69.5-74.5	35	87.5
65-69	3	67	64.5-69.5	34	85
60-64	5	62	59.5-64.5	31	77.5
55-59	9	57	54.5-59.5	26	65
50-54	6	52	49.5-54.5	17	42.5
45-49	4	47	44.5-49.5	11	27.5
40-44	2	42	39.5-44.5	7	17.5
35-39	3	37	34.5-39.5	5	12.5
30-34	2	32	29.5-34.5	2	5