

HASMUKH GOSWAMI COLLEGE OF ENGINEERING, VAHELAL

APPLIED MATHEMATICS FOR ELECTRICAL ENGINEERING (3130908)

TUTORIAL 6: BASIC STATISTICS

1. Find the Arithmetic Mean of the marks obtained by 10 students in class XII in a Mathematics Examination are 42, 35, 48, 17, 45, 40, 55, 21, 30, 25. **Ans: 35.8**

2. Calculate the Mean for the following data: **Ans: 153.45 cm**

Heights (In cm)	135-140	140-145	145-150	150-155	155-160	160-165	165-170	170-175
Number of Boys	4	9	18	28	24	10	5	2

3. The Mean of the following frequency table is 50. But the frequencies f_1 and f_2 in the classes 20-40 and 60-80 are missing. Find missing frequencies. **Ans: $f_1=28, f_2=24$**

Class	0-20	20-40	40-60	60-80	80-100	TOTAL
Frequencies	17	f_1	32	f_2	19	120

4. Find the Arithmetic Mean from the following: **Ans: 35**

Marks Less than	10	20	30	40	50	60
No of students	10	30	60	110	150	180

5. Calculate the Mean from the following data: **Ans: 20.33**

Marks	1-5	6-10	11-15	16-20	21-25	26-30	31-35	36-40	41-45
No of students	7	10	16	30	24	17	10	5	1

6. The Arithmetic Mean of 50 items of a series was calculated by a student as 20. However, it was later discovered that an item of 25 was misread as 35. Find the correct value of Mean. **Ans: 19.8**

7. The average salary of male employees is Rs.5200 and that of females is Rs. 4200. The Mean salary of all the employees is Rs. 5000. Find the percentage of male and female employees. **Ans: 80%, 20%**

8. 50 Students appeared in a class test. The result of those who passed the class test is given below:

Marks	4	5	6	7	8	9
Students	8	10	9	6	4	3

If the average for all the fifty students was 5.16 Marks, find the average marks those who failed.

Ans: 2.1

9. A student secures the following percentage of marks in an examination:

Calculus	Physics	EG	EME	CS
75	60	59	55	63

Find the weighted mean if weights 2,1,3,3 and 1 respectively are allotted to the subject. Calculate the simple mean also. **Ans: 62.4 Marks**

10. The following data is the daily wages of the 20 workers:

110, 100, 103, 98, 151, 145, 85, 132, 95, 125, 130, 80, 76, 62, 71, 122, 65, 142, 118, 116.

Find Arithmetic Mean by constructing a grouped distribution with class mark 19.

[Hint: First class is 61-80.]

Ans: 39.50

11. Find the Arithmetic Mean of marks obtained by 60 students in a mathematics test: **Ans: 26.5**

Marks	More than 0	More than 10	More than 20	More than 30	More than 40	More than 50
No. of Students	60	56	40	20	10	3

12. Prove that the algebraic sum of deviation from the mean is zero. **OR** If the mean of n observations $x_1, x_2, x_3, \dots, x_n$ is \bar{x} then prove that $(x_1 - \bar{x}) + (x_2 - \bar{x}) + \dots + (x_n - \bar{x}) = 0$.

13. The Median of the following observations arranged in ascending order: 11, 12, 14, 18, $x+2$, $x+4$, 30, 32, 35, 41 is 24. Find x . **Ans: $x=21$**

14. From the following data, calculate the Median:

Ans: 12.147

Marks (Less than)	5	10	15	20	25	30	35	40	45
No. of students	29	224	465	582	634	644	650	653	655

15. The following table gives the marks obtained by 50 students in Mathematics. Find the Median.

Marks	10-14	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Students	4	6	10	5	7	3	9	6

Ans: 29.5

16. Find the missing frequency x when Median is 24.

Ans: 25

Marks	0-10	10-20	20-30	30-40	40-50
Students	15	20	x	14	16

17. Find Median from the following data:

Ans: 32.71

Classes	10-15	15-17.5	17.5-20	20-30	30-35	35-40	40-50
Frequency	10	15	17	25	28	31	40

[Hint: Make equal classes such as 10-20, 20-30,.....]

19. Find the Median of the following data:

Ans: 41.6 Years

Age Greater than (in years)	0	10	20	30	40	50	60	70
No. of Persons	230	218	200	165	123	73	28	8

20. Calculate the Median of the following distribution of marks obtained by 50 students in the subject Numerical and Statistical Methods.

Ans: 27.5

Marks more than	0	10	20	30	40	50
No. of students	50	46	40	20	10	3

21. An incomplete frequency distribution is given as follows:

Ans: 50, 40

Variable	0-5	5-10	10-15	15-20	20-25	25-30	Total
Frequencies	15	125	?	66	?	4	300

Given that the Median value is 11, calculate the missing frequencies.

22. Calculate the Median from the given series of scores obtained by the players: 10, 12, 8, 14, 56, 36, 44, 42, 32, 22, 4.

Ans: 22

23. Determine missing value when mode is 67.

Ans: A=8, B=12

Class	40-50	50-60	60-70	70-80	80-90	Total
Frequencies	5	A	15	B	7	47

24. Find the Mode from the daily wage of 20 workers: 70, 80, 90, 60, 85, 100, 80, 60, 65, 80, 75, 90, 95, 80, 90, 100, 70, 80, 60, 75.

Ans: 80

25. The frequency distribution of marks obtained by 60 students of a class in a college is given by

Marks	30-34	35-39	40-44	45-49	50-54	55-59	60-64
Frequencies	3	5	12	18	14	6	2

Find the Mode of the distribution.

Ans: 47.5

26. Calculate the Mode from the following frequency distribution:

Ans: 58

x	50	51	52	53	54	55	56	57	58	59	60
f	2	4	5	6	8	5	4	7	11	5	3

27. Calculate the Mode from the following distribution:

Ans: 11.26

Marks (Less than)	7	14	21	28	35	42	49
No. of students	20	25	33	41	45	50	52

28. If the Mode and Mean of a moderately asymmetrical series are 80 and 68, what will be the most probable Median?

Ans: 72

29. Find the Mode for the following distribution:

Ans:1.47

Class interval	0-10	10-20	20-30	30-40	40-50
Frequencies	45	20	14	7	3

30. Calculate the Geometric and Harmonic Means of the following series of monthly expenditure (in Rs.) of a batch of students: 125, 130, 75, 10, 45, 0.5, 0.4, 500, 1505 **Ans: 22.98 Rs, 2.06 Rs**

31. If the Arithmetic Mean of two observations is 15 and their Geometric Mean is 9, find their Harmonic Mean and the two observations. **Ans: H.M.=5.4, $X_1=27$ & $X_2=3$**

32. Calculate the Geometric and Harmonic Means of the following data: **Ans: 26.07, 22.92**

Class intervals	5-15	15-25	25-35	35-45	45-55
Frequency	6	9	15	8	4

33. Calculate the standard deviation of the weights (in Kg) of 10 persons: 45, 49, 55, 50, 41, 44, 60, 58, 53, 55. **Ans: 5.967**

34. The Mean and Standard deviation of 100 items are found to be 40 and 10. At the time of calculations, two items are wrongly taken as 30 and 72 instead of 3 and 27. Find the correct Mean and correct Standard deviation. **Ans: 39.28, 10.18**

35. The Mean & Standard deviation of distributions of 100 and 150 items are 50, 5 & 40, 6 respectively. Find the Mean and Standard deviation of all the 250 items taken together. **Ans: 44, 7.46**

36. A sample of 90 values has a Mean of 55 and a Standard deviation of 3. A second sample of 110 values has a Mean of 60 and a Standard deviation of 2. Find the Mean and Standard deviation of the combined sample of 200 values. **Ans: 3.53**

37. Two automatic filling machines A and B are used to fill a mixture of cement concrete in a beam. A random sample of beams on each machine showed the following information:

Machine A	32	28	47	63	71	39	10	60	96	14
Machine B	19	31	48	53	67	90	10	62	40	80

Find the standard deviation of each machine and also comment on the performances of the two machines. **Ans: $A = 25.495$, $B = 24.429$, $CV_A = 55.423\%$, $CV_B = 48.858\%$**

38. The runs scored by two batsman A and B in 9 consecutive matches are given below:

A	85	20	62	28	74	5	69	4	13
B	72	4	15	30	59	15	49	27	26

Which of the batsman is more consistent? **Ans: $A = 30.37$, $B = 21.18$, $CV_A = 75.925\%$, $CV_B = 64.18\%$**

39. Find Mean and Standard deviation of the following distribution: **Ans: Mean=30.21, S.D.=7.94**

Age (in years)	<20	<25	<30	<35	<40	<45	<50
No. of persons	0	170	280	360	405	445	480

40. Define: Skewness. Calculate Karl Pearson's coefficient of Skewness from the following data:

Marks	0-10	10-20	20-30	30-40	40-50	50-60	60-70
No of candidates	10	15	24	25	10	10	6

Ans: 0.0476

41. Karl Pearson's measure of Skewness of a distribution is 0.5. Its Median and Mode are respectively 42 and 36. Find the coefficient of variation. **Ans: 40**

42. In a distribution, Mean=65, Median=70, Coefficient of Skewness= -6. Find the Mode and Coefficient of variation. **Ans: Mode=80, CV=39.78%**