UPES
MATH2058 : Applied Statistics and Probability
Question Bank
Date: September 22, 2025

Instructions

- Questions for practice

Question 0.1. *For the two frequency distributions given in the following table, the mean calculated from the first was* 25.4 *and that from the second was* 32.5*. Find the values of* x *and* y*.*

Class	Distribution I Frequency	Distribution II Frequency
$10-20$	20	4
$20-30$	15	8
$30-40$	10	4
$40-50$	x	$2x$
$50-60$	y	y

Table 1: Table for Question 0.1

Question 0.2. *An incomplete frequency distribution is given in Table 2: Given that the*

Variable	Frequency
$10-20$	12
$20-30$	30
$30-40$	?
$40-50$	65
$50-60$	?
$60-70$	25
$70-80$	18

Table 2: Table for Question 0.2

median value is 46*, determine the missing frequencies, using the median formula.*

Question 0.3. *In a factory employing* 3000 *persons, in a day* 5% *work less than* 3 *hours,* 580 *work from* 3.01 *to* 4.5 *hours,* 30% *work from* 4.51 *to* 6 *hours,* 500 *work from* 6.01 *to* 7.5 *hours,* 20% *work from* 7.51 *to* 9 *hours and the rest work* 9.01 *or more hours. What is the median hours of work?*

Question 0.4. *The median and mode of the following wage distribution (refer Table 3) are known to be Rs.* 3350 *and Rs.* 3400 *respectively. Find the values of* $f_3, f_4,$ *and* f_5*:*

Wages in (Rs.)	No. of Employees
$0 - 1000$	4
$1000 - 2000$	16
$2000 - 3000$	f_3
$3000 - 4000$	f_4
$4000 - 5000$	f_5
$5000 - 6000$	6
$6000 - 7000$	4

Table 3: Table for Question 0.4

Question 0.5. *From the Table 4 showing the wage distribution in a certain factory, determine:*

1. *the mean wages,*
2. *the median wages*
3. *the modal wages*
4. *the wage limits for the middle* 50% *of the wage earners.*

Weekly Wages (Rs.)	No. of employees	Weekly Wages (Rs.)	No. of employees
$20 - 40$	8	$120 - 140$	35
$40 - 60$	12	$140 - 160$	18
$60 - 80$	20	$160 - 180$	7
$80 - 100$	30	$180 - 200$	5
$100 - 120$	40		

Table 4: Table for Question 0.5

Question 0.6. *Define (i) Arithmetic Mean, (ii) Median, and (iii) Mode of grouped and ungrouped data. Compare and contrast their merits and demerits.*

Question 0.7. *(i) Explain the main difference between mean deviation and standard deviation.*
(ii) Distinguish between absolute and relative measure of dispersion.

Question 0.8. *Explain the methods of measuring Skewness and Kurtosis of a frequency distribution.*

Question 0.9. *Define moments. What is its use? Express first four central moments in terms of moments about origin.*

Question 0.10. *For a group of* 200 *candidates, the mean and standard deviation of scores were found to be* 40 *and* 15 *respectively. Later on it was discovered that the scores* 43 *and* 35 *were misread as* 34 *and* 53 *respectively. Find the corrected mean and standard deviation corresponding to the corrected figures.*
NOTE: *Assume that scores are only non-negative integers, and a score can have frequency* > 1.

x	0	1	2	3	4	5	6	7	8
f	1	8	28	56	70	56	28	8	1

Table 5: Table for Question 0.11

Question 0.11. *Calculate the first four moments of the following distribution (see Table 5) about the mean and hence find* β_1 *and* β_2*.*

Question 0.12. *For the frequency distribution (see Table 6) of scores in mathematics of* 50 *candidates selected at random from among those appearing at a certain examination, compute the first four moments about the mean of the distribution.*
Find also the moments coefficients of skewness and Kurtosis and comment on the nature of the distribution.

Scores:	50 − 60	60 − 70	70 − 80	80 − 90	90 − 100	100 − 110	110 − 120	120 − 130	130 − 140
Frequency:	1	0	0	1	1	2	1	0	4
Scores:	140 − 150	150 − 160	160 − 170	170 − 180	180 − 190	190 − 200	200 − 210	210 − 220	220 − 230
Frequency:	4	2	5	10	11	4	1	1	2

Table 6: Table for Question 0.12