

Answer on Question #60594 – Math – Statistics and Probability

Question

2. a) The distribution of marks obtained by 500 candidates in a particular exam is given below:

Marks more than: 0 10 20 30 40 50

Number of candidates 500 460 400 200 100 30

Calculate the lower quartile marks. If 70% of the candidates pass in the exam, find the minimum marks obtained by a pass candidate.

Solution

Marks	Frequency	Relative Frequency	Cumulative Frequency
0 - 10	$500-460=40$	$40/500=0.08$	0.08
10 - 20	$460-400=60$	$60/500=0.12$	$0.08+0.12=0.2$
20 - 30	$400-200=200$	$200/500=0.40$	$0.2+0.4=0.6$
30 - 40	$200-100=100$	$100/500=0.20$	$0.6+0.2=0.8$
40 - 50	$100-30=70$	$70/500=0.14$	$0.8+0.14=0.94$
>50	30	$30/500=0.06$	$0.94+0.06=1$

The lower quartile marks are between 20 and 30.

If 70% of the candidates pass in the exam, then only 30% don't pass it.

The minimum marks obtained by a pass candidate are between 20 and 30.

Question

b) An analysis of monthly wages paid to the workers of two firms A and B belonging to the same industry gives the following results:

	Firm A	Firm B
Number of workers	500	600
Average daily wages	186	175
Variance of distribution of wages	81	100

i) Which firm, A or B, has a large wage bill?

ii) In which firm, A or B, is there greater variability in individual wages

Solution

i) **Firm A**

Total monthly wage = $\$186 \cdot 500 = \93000 .

Firm B

Total monthly wage = $\$175 \cdot 600 = \105000 .

Firm B pays out larger amount of monthly wage.

ii)

Firm A

Coefficient of variation = $\frac{\sigma}{\bar{x}} = \frac{\sqrt{81}}{186} = 0.0484$.

Firm B

Coefficient of variation = $\frac{\sigma}{\bar{x}} = \frac{\sqrt{100}}{175} = 0.0571$.

There is greater variability in wages in Firm B.