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CT100/G/21430/24

Department of Pure and Applied Sciences: BIT Y1S2----Group A

PROBABILITY AND STATISTICS I   STA 2140   CAT 1   Time :1hr

(16/20)

1.) Find the harmonic and the geometric mean of: 204, 68 ,150 ,30 ,70 ,95, 60 ,76, 24, 19   (4 marks)

$$Hm = n\sqrt{x_1 \times x_2 \times x_3}$$ harmonic mean $= 10\sqrt{204 \times 68 \times 150 \times 30 \times 70 \times 95 \times 60 \times 76 \times 24 \times 19}$

$$10\sqrt{8.6318 \times 10^{17}} = 62.17$$ (4)

$$\frac{n}{\frac{f_1}{x_1} + \frac{f_2}{x_2} + \frac{f_3}{x_3}}$$

Geometric mean $= \dfrac{10}{\frac{1}{204} + \frac{1}{68} + \frac{1}{150} + \frac{1}{30} + \frac{1}{70} + \frac{1}{95} + \frac{1}{60} + \frac{1}{76} + \frac{1}{24} + \frac{1}{19}} = \dfrac{10}{0.2085}$

$= 47.961$

2. At an outpatient testing center, the number of cardiograms performed each day for 20 days is shown.   Construct a stem and leaf plot for the data. 25, 31 ,20 ,32 ,13, 14 ,43, 02, 23 ,36 ,32, 33 ,32, 44, 32, 52, 44 ,51 ,45   (2 marks)

stem	leaf
0	2
1	3 5 3 4
2	0 3 5
3	1 2 2 2 2 3 6
4	4 4 5
5	1 2

(2)

3). Use the data below to calculate the median , 4th decile and 60th percentile   (6 marks)

Class	Frequency	Cumulative frequency
21-25	5	5
26-30	15	20
31-35	28	48
36-40	42	90
41-45	15	105
46-50	12	117
51-55	3	120
	120	

4th decile

$$Q^{4th} = \frac{4}{10}(n+1)$$

$$\frac{4}{10} \times 120 = 48$$

$= 35.5$

$$35.5 + \left(\frac{0}{42}\right)5$$

$35.5 + 0$

$= 35.5$

(2)

60th percentile

$$\frac{60}{100} \times 120 = 72$$

$72 - 48$

$$35.5 + \left(\frac{24}{42}\right)5$$

$35.5 + 2.857$

$= 38.357$

(2)

7,11, 13, 17, 1,7, 18, 20, 29, 24, 30, 31, 33, 34, 39, 41, 46, 50, 54, 56, 56, 69, 72, 86, 31

4. The following sample data set lists the number of minutes 25 Internet subscribers spent on the Internet during their most recent session. 50, 72, 56, 17, 7, 69, 30, 86, 56, 29, 33, 46, 31, 39, 20, 18, 29, 54, 86, 41, 17, 11, 13, 34, 87. Determine the interquartile range

(3marks)

$Q_2 = Q_3 - Q_1$

$Q_3 = \frac{3}{4}(n+1)$

$Q_1 = \frac{1}{4}(n+1)$

$n = 25$

$Q_3 = \frac{3}{4}(25+1)$

$\frac{3}{4} \times 26 = 19.5^{th}$

$56 + 0.5(56-56)$

$= 56$

$Q_1 = \frac{1}{4}(25+1)$

$\frac{1}{4}(26) = 6.5^{th}$

$18 + 0.5(20-18)$

$18 + 1 = 19$

$Q_2 = 56 - 19$

$= 37$

5. Differentiate Qualitative variables and Quantitative variables giving an example in each case

(2marks)

Qualitative Variables

6. Construct a pareto graph showing the blood types of patients in certain medical ward described in the frequency distribution below. (3 marks)

Blood group	A	B	AB	0
Frequency	5	7	4	9