

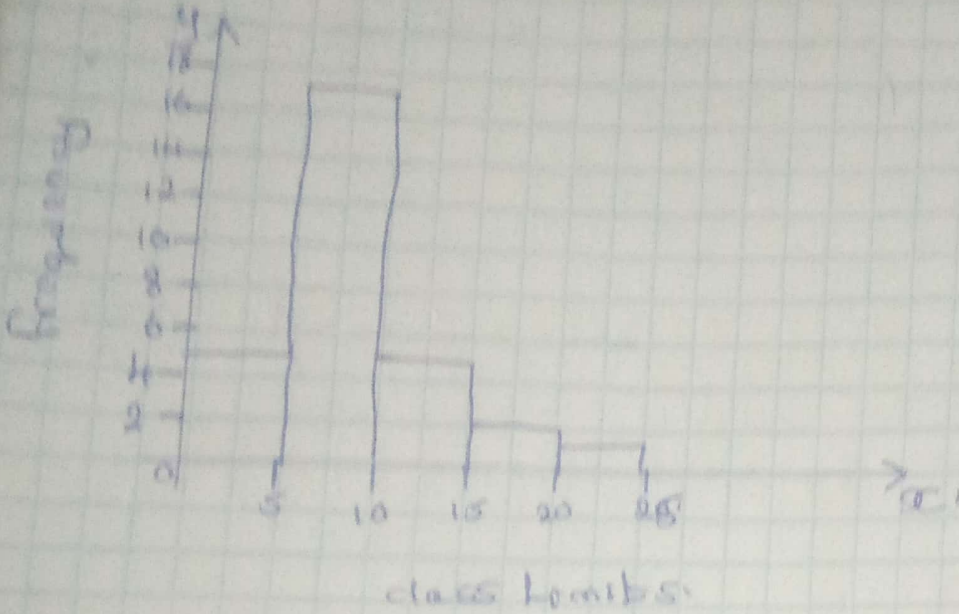
(A)

Question 3

20 people

Class	Frequency
1-5	5
6-10	12
11-15	8
16-20	4
21-25	1

Histogram



$$(i) \text{ Mean} = \frac{\sum fx}{N} = \frac{277}{20} = 13.85$$

$$\text{Median} = L.C + \frac{\left(\frac{n}{2} - m\right) C_1}{F}$$

$$5.5 + \frac{(15 - 5) \times 5}{8} = 5.5 + \frac{10}{8}$$

$$= 5.5 + 1.25$$

$$\text{Mode} = 8.5$$

(ii) most people do exercise for 5 to 10 hours.

(iii) frequency polygon.

simple bar graph.

### Question 3 B

	Got a cold	Did not get a cold	
Vitamin C	17	122	139
Placebo	31	109	140

$$P_1 = \frac{y_1}{r_1} = \frac{17}{139}$$

$$P_2 = \frac{y_2}{r_2} = \frac{31}{140}$$

$$RD = \frac{17}{139} - \frac{31}{140} = \frac{2082}{182091}$$

$$\text{Var}(P_1 - P_2) = \frac{17}{139} \left( \frac{17}{139} \right) + \frac{31}{140} \left( \frac{31}{140} \right) = \frac{374}{182091} + \frac{242}{182091} = \frac{616}{182091} = 0.003383$$

$$C.I = \frac{-2082}{182091} \pm 1.96 \times \sqrt{0.003383}$$

$$= \frac{-2082}{182091} \pm 0.081687952$$

$$= -0.011435, -0.029146$$

H<sub>1</sub> (4) Prob of getting cold is lesser in vitamin C group than in the placebo group

H<sub>2</sub> (4) Prob of getting cold is higher in vitamin C group than in the placebo group

$$\Sigma_{11} = \frac{139 \times 20}{270} = \frac{1112}{45}$$

$$\Sigma_{12} = \frac{139 \times 222}{270} = \frac{5143}{45}$$

$$E_{22} = \frac{131 \times 222}{270} = \frac{4847}{45}$$

$$E_{12} = \frac{131 \times 48}{270} = \frac{1048}{45}$$

$$\chi^2 = \frac{\left(17 - \frac{1112}{45}\right)^2}{\frac{1112}{45}} + \frac{\left(22 - \frac{5143}{45}\right)^2}{\frac{5143}{45}} + \frac{\left(31 - \frac{4847}{45}\right)^2}{\frac{4847}{45}} + \frac{\left(100 - \frac{1048}{45}\right)^2}{\frac{1048}{45}} = 310.2379$$

$$\chi^2 = 3.841$$

$310.2379 > 3.841$  we reject the null hypothesis