حساب معامل الالتواء a =

$$a = \frac{3(\bar{x} - Me)}{\sum Fi}$$

ومنه بالتعويض في Me نجد حساب

$$a = \frac{3(9,4444 - 9,2)}{36}$$

$$a = \frac{3(0,2444)}{36} = \frac{0,7332}{36}$$

$$\boxed{a = 0,0203}$$

ومنه a أكبر من 0 وبالتالي

معامل الالتواء موجب.

حساب التباين δ^2

$$\delta^2 = \frac{\sum Fi\,(Ci - \bar{x})^2}{\sum Fi}$$

$$\delta^2 = \frac{F_1(c_1-\bar{x})^2 + F_2(c_2-\bar{x})^2 + F_3(c_3-\bar{x})^2 + F_4(c_4-\bar{x})^2 + F_5(c_5-\bar{x})^2}{\sum Fi}$$

$$\delta^2 = \frac{3(5-9,4444)^2 + 6(7-9,4444)^2 + 15(9-9,4444)^2 + 4(11-9,4444)^2 + 8(13-9,4444)^2}{36}$$

$$\delta^2 = \frac{59,2578 + 35,85 + 2,961 + 23,9 + 158,0208}{36}$$

$$\delta^2 = \frac{279,9896}{36}$$

$$\boxed{\delta^2 = 7,7774}$$

حساب الانحراف المعياري

$$s = \sqrt{\delta^2}$$

$$s = \sqrt{7,7774} = \boxed{2,7887}$$

$$\boxed{s = 2,7887}$$

$\bar{x} = \frac{340}{36} = 9,4444$ وجبة

$\boxed{\bar{x} = 9,4444}$

classes	Fi	Fr	Fr %	Fcc↑	Fcb↓	Ci	Ci.Fi	$C_i - \bar{x}$	$(C_i-\bar{x})^2$	$\Sigma Fi(Ci-\bar{x})^2$
				0	36					
[4-6[	3	0,0833	8,33	3	33	5	15	-4,4444	19,7526	59,2578
[6-8[	6	0,1666	16,66	9	27	7	42	-2,4444	5,9750	35,85
[8-10[	15	0,4166	41,66	24	12	9	135	-0,4444	0,1974	2,961
[10-12[	4	0,1111	11,11	28	8	11	44	2,4444	5,9750	23,9
[12-14]	8	0,2222	22,22	36	0	13	104	4,4444	19,7526	158,0208
Σ	36	1	100%	/	/	/	340	/	/	279,9896

حساب الوسيط Me

$$Me = L_0 + \frac{\frac{\Sigma Fi}{2} - F_1}{F_2 - F_1} \times K$$

نحسب $Rme = \frac{\Sigma Fi}{2} = \frac{36}{2}$

$\boxed{Rme = 18}$

ومطابقتها مع Fcc↑ نجد الفئة [8-10[ومنه

$$Me = 8 + \frac{18 - 9}{24 - 9} \times 2$$

$$Me = 8 + \frac{9}{15} \times 2$$

$$Me = 8 + (0,6 \times 2)$$

$$= 8 + 1,2$$

$\boxed{Me = 9,2}$

حساب المنوال Mo

$$Mo = L_0 + \frac{F_0 - F_1}{(F_0 - F_1) + (F_0 - F_2)} \times K$$

نعين الفئة المنوالية والتي تقابل أكبر تكرار Fi وهي Fi = 15 والتي هي [8-10[

نجد:

$$Mo = 8 + \frac{15 - 6}{(15 - 6) + (15 - 4)} \times 2$$

ومنه

$$Mo = 8 + \frac{9}{9 + 11} \times 2$$

$$Mo = 8 + \frac{9}{15} \times 2$$

$$= 8 + 0,6 \times 2$$

$$= 8 + 1,2$$

$\boxed{Mo = 9,2}$

ci حساب

$$Ci = \frac{\text{الحد الأول} + \text{الحد الثاني}}{2}$$

$$C_1 = \frac{A_1 + B_1}{2} = \frac{6+4}{2} = \frac{10}{2} = 5$$

$$C_2 = \frac{A_2 + B_2}{2} = \frac{8+6}{2} = \frac{14}{2} = 7$$

$$C_3 = \frac{A_3 + B_3}{2} = \frac{10+8}{2} = \frac{18}{2} = 9$$

$$C_4 = \frac{A_4 + B_4}{2} = \frac{12+10}{2} = \frac{22}{2} = 11$$

$$C_5 = \frac{A_5 + B_5}{2} = \frac{14+12}{2} = \frac{26}{2} = 13$$

نحسب $\bar{x}$

$$\bar{x} = \frac{\Sigma(Ci \cdot Fi)}{\Sigma Fi}$$

$$\bar{x} = \frac{(C_1 \cdot F_1) + (C_2 \cdot F_2) + (C_3 \cdot F_3) + (C_4 \cdot F_4) + (C_5 \cdot F_5)}{\Sigma Fi}$$

$$\bar{x} = \frac{(5 \cdot 3) + (7 \cdot 6) + (9 \cdot 15) + (11 \cdot 4) + (13 \cdot 8)}{36}$$

$$\bar{x} = \frac{15 + 42 + 135 + 44 + 104}{36}$$

Fcc↑ حساب ④

$$Fcc\uparrow_{(i+1)} = Fcc\uparrow_{(i)} + Fi$$

$$Fcc\uparrow_1 = Fcc_0 + F_1 = 0 + 3 = 3$$
$$Fcc\uparrow_2 = Fcc_1 + F_2 = 3 + 6 = 9$$
$$Fcc\uparrow_3 = Fcc_2 + F_3 = 9 + 15 = 24$$
$$Fcc\uparrow_4 = Fcc_3 + F_4 = 24 + 4 = 28$$
$$Fcc\uparrow_5 = Fcc_4 + F_5 = 28 + 8 = 36$$

Fcd↓ حساب ⑤

$$Fcd\downarrow_{(i-1)} = Fcd_{(i)} - F_1$$

$$Fcd\downarrow_0 = Fcd\downarrow_0 - F_1 = 36 - 3 = 33$$
$$Fcd\downarrow_1 = Fcd\downarrow_1 - F_2 = 33 - 6 = 27$$
$$Fcd\downarrow_2 = Fcd\downarrow_2 - F_3 = 27 - 15 = 12$$
$$Fcd\downarrow_3 = Fcd\downarrow_3 - F_4 = 12 - 4 = 8$$
$$Fcd\downarrow_4 = Fcd\downarrow_4 - F_5 = 8 - 8 = 0$$

③ حساب النزعة المركزية:

① حساب المتوسط الحسابي $\bar{x}$ =

$$\bar{x} = \frac{\Sigma(Ci \cdot Fi)}{\Sigma Fi}$$

لابد نحسب أولا ci

③ حساب التكرار المئوي Fi%

$F_K\% = F_K \times 100$

$F_1\% = F_1 \times 100 = 0,0833 \times 100 = 8,33\%$

$F_2\% = F_2 \times 100 = 0,1666 \times 100 = 16,66\%$

$F_3\% = F_3 \times 100 = 0,4166 \times 100 = 41,66\%$

$F_4\% = F_4 \times 100 = 0,1111 \times 100 = 11,11\%$

$F_5\% = F_5 \times 100 = 0,2222 \times 100 = 22,22\%$

$\sum F_K\% = F_1\% + F_2\% + F_3\% + F_4\% + F_5\%$

$= 8,33\% + 16,66\% + 11,11\% + 41,66\% + 22,22\% = 99,98\%$

$\sum F_r\% = 99,98\% \simeq 100\%$

الطريقة 2

① إيجاد قيمة xi

$\sum Fi = n$

$\sum Fi = F_1 + F_2 + xi + F_3 + F_4$

$36 = 3 + 6 + xi + 4 + 8$

$36 = xi + (3 + 6 + 4 + 8)$

$36 = xi + 21$

$xi = 36 - 21$

$\boxed{xi = 15}$

② حساب Fr

$Fr = \frac{Fi}{\sum Fi}$

$F_1 = \frac{F_1}{\sum Fi} = \frac{3}{36} = \boxed{0,0833}$

$F_2 = \frac{F_2}{\sum Fi} = \frac{6}{36} = \boxed{0,1666}$

$F_3 = \frac{F_3}{\sum Fi} = \frac{15}{36} = \boxed{0,4166}$

$F_4 = \frac{F_4}{\sum Fi} = \frac{4}{36} = \boxed{0,1111}$

$F_5 = \frac{F_5}{\sum Fi} = \frac{8}{36} = \boxed{0,2222}$

$\sum Fr = F_{r1} + F_{r2} + F_3 + F_4 + F_5$

$\boxed{\sum Fr = 0,9998} \simeq 1$