Q3

$n = 200$

Incorrect $\bar{X} = 50$

$$\bar{x} = \frac{\text{sum of observation}}{\text{total no of observation}}$$

$$50 = \frac{\text{Sum}}{200}$$

Incorrect Sum $= 50 \times 200$

$$= 10000$$

Correct Sum $= 10000 - 92 - 8 + 192 + 88$

$$\Sigma x = 10180$$

$$n = 200$$

$$\bar{x} = \frac{\Sigma x}{n} = \frac{10180}{200}$$

$$\bar{x} = 50.9$$

Q4

$n_1 = 350$	$n_2 = 300$
$\bar{x}_1 = 200$	$\bar{x}_2 = 250$

$$\bar{x} = \frac{n_1 \bar{x}_1 + n_2 \bar{x}_2}{n_1 + n_2}$$

$$\bar{x} = \frac{350 \times 200 + 300 \times 250}{350 + 300}$$

$$= \frac{70000 + 75000}{650}$$

$$= \frac{145000}{650}$$

$$\bar{x} = 223$$

Q7. In ascending order

28, 30, 32, 35, 46, 47, 60, 62, 63, 64

$n = 10$ (even)

$\Rightarrow \dfrac{n}{2} = \dfrac{10}{2} = 5 \qquad \dfrac{n}{2} + 1 = 5 + 1 = 6$

Median $= \dfrac{5^{th} \text{ term} + 6^{th} \text{ term}}{2}$

$= \dfrac{46 + 47}{2} = \dfrac{93}{2} = 46.5$

Q5.

Marks		no. of student	c.f
(17.5 - 19.5)	15 - 19	6	6
(19.5 - 19.5)	20 - 24	14	20
(24.5 - 29.5)	25 - 29	12	32
(29.5 - 34.5)	30 - 34	10	42
(34.5 - 39.5)	35 - 39	10	52
(39.5 - 44.5)	40 - 44	9	61
(44.5 - 49.5)	45 - 49	9	70
(49.5 - 54.5)	50 - 54	10	80
(54.5 - 59.5)	55 - 59	5	85
(59.5 - 64.5)	60 - 64	4	89
(64.5 - 69.5)	65 - 69	1	90

mode $= l + h \left(\dfrac{f_1 - f_0}{2f_1 - f_0 - f_2} \right)$

$= 19.5 + 5 \left(\dfrac{14 - 6}{2 \cdot 8 - 6 - 12} \right)$

$= 19.5 + \dfrac{40}{10}$

$$\frac{146+40}{10} = \frac{235}{10} = 23.5$$

Median $= l + \left(\dfrac{\frac{n}{2} - cf}{f}\right) \times h$

$$= 34.5 + \left(\frac{45 - 42}{10}\right) \times 5$$

$$= 34.5 + \frac{15}{10}$$

$$= \frac{360}{10} = 36$$

$$\bar{x} = A + \frac{\Sigma fd x}{N} \cdot i$$

here $A = 42$, $i = 5$

$\Sigma fd = -87$

$N = \Sigma f \Rightarrow 90$

$$\bar{x} = 42 - \frac{87 \times 5}{90}$$

$$= \frac{-3780 - 435}{90}$$

$$= \frac{3345}{90} = 37.16$$

Q6	wages	no.of persons	cf
	30-40	1	1
	40-50	3	4
	50-60	11	15
	60-70	21	36
	70-80	43	79
	80-90	32	111
	90-100	9	120

(i) $Q_{20} = l + \left(\dfrac{\frac{N}{5} \cdot cf}{b}\right) \times h$

$= 60 + \left(\dfrac{30-15}{21}\right) \times 10$

$= \dfrac{1260 + 150}{21} = \dfrac{1410}{21} = 67.14$

(ii) $Q_3 = l + \left(\dfrac{\frac{3N}{4} - cf}{b}\right) \times h$

$= 80 + \left(\dfrac{90-79}{32}\right) \times 10$

$= \dfrac{2670}{32} = 83.43$

(iii) $D_7 = l + \left(\dfrac{\frac{7N}{10} - cf}{b}\right) \times h$

$= 80 + \left(\dfrac{84-79}{32}\right) \times 10$

$= \dfrac{2560+50}{32} = \dfrac{2610}{32} = 81.56$

(iv) $D_{60} = l + \left(\dfrac{\frac{60N}{100} - cf}{b}\right) \times h$

$= 70 + \left(\dfrac{72-30}{43}\right) \times 10$

$= \dfrac{3010 + 360}{43} \Rightarrow \dfrac{3370}{43} = 78.37$

Q2 | Class | x | f | $x-A$ | $d = \frac{x-A}{?}$

Class	x	f	$x-A$	$d=\frac{x-A}{}$
0-10	10	17	-70	-2
20-40	30	f_1	-70	-1
70-60	50	32	0	0
60-80	70	f_2	20	1
80-100	90	9	40	2

$$\bar{x} = A + \frac{\Sigma f d \times i}{N}$$

$$\Sigma f d = f_2 - f_1 + 4$$

$$N = \Sigma f$$

$$= 66 + f_1 + f_2 = 120 \quad \text{——①}$$

Now, $\bar{x} = A + \dfrac{\Sigma f d \times i}{N}$

$$50 = 50 + \frac{(f_2 - f_1 + 4)\,70}{68 + f_1 + f_2}$$

$$50 - 50 = \frac{(f_2 - f_1 + 4)\,70}{68 + f_1 + f_2}$$

$$0 = \frac{20 f_2 - 70 f_1 + 80}{68 + f_1 + f_2}$$

$$0 = 20 f_2 - 70 f_1 + 80$$

$$70 f_1 = 70(f_2 + 4)$$

$$f_1 = \frac{20(f_2 + 4)}{20}$$

$$f_1 = f_2 + 4 \quad \text{——②}$$

Put the value of f_1 in of ①

$$68 + f_1 + f_2 = 120$$

$$68 + f_2 + 4 + f_2 = 120$$

$$72 + 2f_2 = 120$$

$2f2 = 28$

$f2 = 24$

Now put the value of f in eq ^{n} ①

$f1 = f2 + 4$

$f1 = 24 + 4$

$f1 = 28$

Q1 $\bar{x} = A + \sum \dfrac{fd}{N}$

Q1

Marks	f	x	$x-A$	$d = \dfrac{x-A}{1}$	$f \times d$
70-75	100	72.5	-10	-2	-200
75-80	200	77.5	5	-1	-250
80-85	300	82.5	0	0	0
85-90	400	87.5	5	1	400
90-95	500	92.5	10	2	1000
95-100	600	97.5	15	3	1850
	2100				2850

$\bar{x} = A + \dfrac{\sum fd}{N} \times i$

$= 82.5 + \dfrac{2850 \times 5}{2100}$

$= 82.5 + \dfrac{20}{3} = 82.5 + 6.66$

$\bar{x} = 89.16$