

[4]

- Correlation Coefficient between x and y is 0.66  
(a) Find the two Regression Equations.  
(b) Estimate the value of x when y = 75  
OR iii. Calculate Karl Person's Coefficient of Correlation from the 7 following data:

X	5	9	13	17	21
Y	12	20	25	33	35

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Total No. of Questions: 6

Total No. of Printed Pages: 4

Enrollment No.....



Duration: 3 Hrs.

Faculty of Management Studies

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MS3CO02 Business Mathematics and Statistics

Programme: BBA Branch/Specialisation: Management / DM

Maximum Marks: 60

Note: All questions are compulsory. Internal choices, if any, are indicated. Answers of Q.1 (MCQs) should be written in full instead of only a, b, c or d.

- Q.1 i. The value of  ${}^9c_4$ = 1  
(a) 110 (b) 30  
(c) 126 (d) 27
- ii. The value of  ${}^7P_7$ = 1  
(a) 5000 (b) 5040  
(c) 5020 (d) 5030
- iii. The number of proper subsets of the set {1, 2, 3} is 1  
(a) 8 (b) 7 (c) 6 (d) None of these
- iv. The matrix  $\begin{bmatrix} 8 & 7 & 3 \\ 0 & 5 & 2 \\ 0 & 0 & 6 \end{bmatrix}$  is 1  
(a) Scalar (b) Upper triangular  
(c) Lower triangular (d) Diagonal
- v. The sample mean  $\bar{X}$  is a: 1  
(a) Parameter (b) Statistic  
(c) Variable (d) Constant
- vi. Statistical data are collected for 1  
(a) Without any purpose (b) Any purpose  
(c) Given purpose (d) None of these
- vii. The sum of deviations taken from mean is: 1  
(a) Always equal to zero (b) Sometimes equal to zero  
(c) Never equal to zero (d) Less than zero

P.T.O.

[2]

- viii. If there are ten values each equal to 10, then standard deviation of these values is:  
 (a) 100      (b) 20      (c) 10      (d) 0      1
- ix. A process by which we estimate the value of dependent variable on the basis of one or more independent variables is called:  
 (a) Correlation      (b) Regression  
 (c) Residual      (d) Slope      1
- x. The correlation coefficient is the \_\_\_\_\_ of two regression coefficients.  
 (a) Geometric mean      (b) Arithmetic mean  
 (c) Harmonic mean      (d) Median      1
- Q.2** i. Define Arithmetic Progression. Which term of 4,7,10...is 148?      4  
 ii. Define Ratio. Two figures are in the ratio of 5:6. If 5 is added to both the figures, the new ratio will be 6:7. Find the figures.      6
- OR** iii. Define Proportion. If 6 kg of sugar can be bought for Rs. 320, what quantity cab be bought for Rs. 480?      6
- Q.3** i. Define transpose of a matrix and orthogonal matrix with example.      4  
 ii. If  $A = \begin{bmatrix} 9 & 7 & 3 \\ 5 & -1 & 4 \\ 6 & 8 & 2 \end{bmatrix}$ , Find  $\text{Adj}(A)$  and  $|A|$ .      6
- OR** iii. Define union and intersection of two nonempty sets.      6  
 In a recent survey of 400 students in a school, 100 were listed as smokers and 150 as chewers of gum; 75 were listed as both smokers and gum chewers. Find out how many students are neither smokers nor gum chewers.
- Q.4** i. "Statistics does not study individual". Explain by giving suitable example?      3  
 ii. Draw histogram and frequency polygon for the following data:      7
- |           |      |       |       |       |       |
|-----------|------|-------|-------|-------|-------|
| Class     | 0-10 | 10-20 | 20-30 | 30-50 | 50-80 |
| frequency | 13   | 25    | 40    | 28    | 30    |
- OR** iii. Define multiple bar diagram. Show the given data through a multiple bar diagram.      7

[3]

Years	Exports (in Rs. Million)	Imports (in Rs. Million)
2005	24	9
2006	115	92
2007	84	92
2008	110	120
2009	130	183
2010	162	187

- Q.5 i. Write difference between absolute and relative measure of dispersion?      3  
 ii. An analysis of monthly salary 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              | 100    | 120    |
| Average monthly salary         | 2500   | 2800   |
| Variance distribution of wages | 200    | 250    |
- (a) Which firm, A or B, has a larger wage bill?  
 (b) In which firm, A or B, is there greater variability in individual wages?
- OR** iii. An incomplete frequency distribution is given as follows:      7
- | Class     | 10-20 | 20-30 | 30-40 | 40-50 | 50-60 | 60-70 | 70-80 |
|-----------|-------|-------|-------|-------|-------|-------|-------|
| frequency | 12    | 30    | ?     | 65    | ?     | 25    | 18    |
- Given median value is 46, determine the missing frequencies, using the median formula. (Given total frequency =229)
- Q.6 i. Define Correlation, Positive correlation and Negative correlation with examples.      3  
 ii. Your given the following data:  

x	y	
Arithmetic Mean	36	85
Standard Deviation	11	8

 P.T.O.

# Marking Scheme

## MS3C002: BUSINESS MATHEMATICS & STATISTICS.

(Q1) (i) (c) 126	+1
(ii) (b) 5040	+1
(iii) (a) 3 7 ✓	+1
(iv) (b) upper triangular	+1
(v) (b) statistic	+1
(vi) (c) Given purpose.	+1
(vii) (a) Always equal to zero	+1
(viii) (d) 0	+1
(ix) (b) Regression.	+1
(x) (a) Geometric mean.	+1
	Total 10

(Q2) (i) Arithmetic Progression : A Sequence $a_1, a_2, a_3, \dots, a_n$ is said to be in Arithmetic Progression (or simply in A.P.) when $a_2 - a_1 = a_3 - a_2 = \dots = a_n - a_{n-1}$ i.e when the quantities increase or decrease continually by a common quantity. The constant difference is called common difference. For e.g. 1, 3, 5, 7 ... is in A.P Given series is 4, 7, 10, ... let the n <sup>th</sup> term of the A.P is 148. Now $a_1 = 4$	+2
	+1

P.T.O

(Q)

Arithmetic progression  
 (common difference is constant)  
 first term & common difference

$$d = 3, n = ? \quad a_n = 148$$

$$n^{\text{th}} \text{ term} = 2 + (n-1) \cdot 3 = 2 + 3n - 3 = 3n + 1$$

$$\text{Now } 3n + 1 = 148$$

$$3n = 147$$

$$n = 147/3 = 49$$

Total

(Q2(iii)) Ratio: The quantitative relation between two amounts showing the number of times one value contains or it is contained within the other. We write ratio as  $a:b = \frac{a}{b}$ . In the ratio the first term is antecedent & other is consequent.

Given two figures are in ratio of 5:6

Let the value of the unknown be  $x$ .

Ratio in 1<sup>st</sup> case 5:6

After addition 6:7

According to condition.

$$\frac{(5x+5)}{(6x+5)} = \frac{6}{7}$$

Cross multiply them

$$(5x+5) \times 7 = (6x+5) \times 6$$

$$\Rightarrow 35x + 35 = 36x + 30$$

$$\Rightarrow 36x - 35x = 35 - 30$$

$$\Rightarrow x = 5$$

So, the no. are  $5x$  &  $6x$

$$5 \times 5 = 25 \quad 6 \times 5 = 30$$

Ans

(3)

Q2(iii) Proportion :- A proportion is an equation that states that two ratios are equal. It can be written as

$$a:b = c:d \text{ or } a:b :: c:d$$

Here  $a$  &  $d$  are called extremes  
while  $b$  &  $c$  are called mean terms.  
Also  $a:b :: c:d \Leftrightarrow b \times c = a \times d$ .

Given 6 kg of sugar can be bought for Rs 320.

We know that in less amount less quantity can be found out & in more amount more quantity can be found out so we can solve this problem using proportion.

Suppose  $x$  quantity of sugar can be bought out using Rs 480.

AMOUNT	SUGAR	
320	6	+1
480	$x$	= i

$$320 : 480 :: 6 : x$$

$$\text{On solving } \frac{320}{480} = \frac{6}{x} \quad +1$$

$$\Rightarrow 320x = 6 \times 480 \quad +1$$

$$\Rightarrow x = \frac{36 \times 480}{320} = 9 \quad +1$$

$$\cancel{\frac{32}{32}} \cancel{x} \cancel{6}$$

∴ 9 kg of sugar can be bought using 480 Rs. Total 6

(W)

(Q3(i))

TRANSPOSE OF A MATRIX - The transpose of a matrix  $A$  is the matrix obtained from  $A$  by interchanging its rows and columns and it is denoted by  $A^T$  or  $A'$ .

The order of the transpose of an  $m \times n$  matrix is  $n \times m$ .

for e.g.

$$\text{If } A = \begin{bmatrix} 1 & -2 & 3 \\ 2 & 1 & -5 \end{bmatrix} \text{ then}$$

$$A^T = \begin{bmatrix} 1 & 2 \\ -2 & 1 \\ 3 & -5 \end{bmatrix} \quad 3 \times 2$$

Orthogonal Matrix = A square matrix is said to be orthogonal if  $AA' = A'A = I$   
Thus the product of matrix and its transpose result in Unit matrix.

for e.g.  $A = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$  is orthogonal.

$$\text{as } A^T = \frac{1}{\sqrt{2}} \begin{bmatrix} 1 & 1 \\ -1 & 1 \end{bmatrix}$$

$$AA' = \frac{1}{2} \begin{bmatrix} 2 & 0 \\ 0 & 2 \end{bmatrix} = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$$

Hence orthogonal.

Total 4

(Q3)(i) Given

$$F = P \begin{pmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \\ 7 & 8 & 9 \end{pmatrix}$$

$$A = \begin{pmatrix} 9 & 7 & 3 \\ 5 & -1 & 4 \\ 6 & 8 & 2 \end{pmatrix}$$

$$\text{Adj } A = \begin{pmatrix} C_{11} & C_{12} & C_{13} \\ C_{21} & C_{22} & C_{23} \\ C_{31} & C_{32} & C_{33} \end{pmatrix} = \begin{pmatrix} C_{11} & C_{12} & C_{13} \\ C_{12} & C_{22} & C_{32} \\ C_{13} & C_{23} & C_{33} \end{pmatrix} + I$$

$$\text{Now } C_{11} = (-1)^{1+1} \begin{vmatrix} -1 & 4 \\ 8 & 2 \end{vmatrix} = -2 - 32 = -34$$

$$C_{12} = (-1)^{1+2} \begin{vmatrix} 5 & 4 \\ 6 & 2 \end{vmatrix} = -[10 - 24] = 14$$

$$C_{13} = (-1)^{1+3} \begin{vmatrix} 5 & -1 \\ 6 & 8 \end{vmatrix} = 40 + 6 = 46$$

$$C_{21} = (-1)^{2+1} \begin{vmatrix} 7 & 3 \\ 8 & 2 \end{vmatrix} = -[14 - 24] = 10$$

$$C_{22} = (-1)^{2+2} \begin{vmatrix} 9 & 3 \\ 6 & 2 \end{vmatrix} = 18 - 18 = 0$$

(6)

$$c_{23} = (-1)^{2+3} \begin{vmatrix} 9 & 7 \\ 6 & 8 \end{vmatrix} = -[72 - 42] = -30$$

$$c_{31} = (-1)^{3+1} \begin{vmatrix} 7 & 3 \\ -1 & 4 \end{vmatrix} = 28 + 3 = 31$$

$$c_{32} = (-1)^{3+2} \begin{vmatrix} 9 & 3 \\ 5 & 4 \end{vmatrix} = -[36 - 15] = -21$$

$$c_{33} = (-1)^{3+3} \begin{vmatrix} 9 & 7 \\ 5 & -1 \end{vmatrix} = -[9 - 35] = -44 + 2$$

Putting the values in formula above

we get

$$\text{Adj } A = \begin{bmatrix} -34 & 10 & 31 \\ 14 & 0 & -21 \\ 46 & -30 & -44 \end{bmatrix} \text{ Ans} + 1$$

$$\begin{aligned} \text{Now } |A| &= \begin{vmatrix} 9 & 7 & 3 \\ 5 & -1 & 4 \\ 6 & 8 & 2 \end{vmatrix} + 1 \\ &= 9[-2 - 32] - 7[10 - 24] + 3[40 + 6] \\ &= 9[-34] - 7[-14] + 3[46] \end{aligned}$$

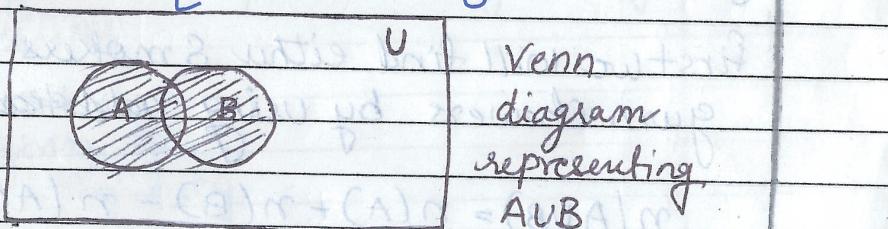
(7)

$$\begin{aligned}
 &= 9[-34] - 7[-14] + 3[46] \\
 &\equiv -306 + 98 + 138 \\
 &\equiv -306 + 236 = -70
 \end{aligned}
 \quad \begin{array}{l} +1 \\ \text{Total}=6 \end{array}$$

**Q8(iii) Union of two sets** Let A & B be two nonempty sets. The union of A & B is the set of all elements which either belongs to A or B or both. The union of A & B is denoted by  $A \cup B$  and is read as A union B. Symbolically  $A \cup B = \{x : x \in A \text{ or } x \in B\}$

The symbol  $\cup$  stands for union.

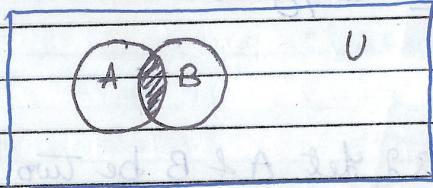
for e.g.  $A = \{1, 2, 3, 4, 5\}$  &  $B = \{4, 5, 6, 7\}$   
 $A \cup B = \{1, 2, 3, 4, 5, 6, 7\}$



**Intersection of sets** - Let A & B be two nonempty sets. The intersection of A & B is the set of all elements which belong to both A and B. In other words, the intersection of A & B is the set of common members of A and B. The intersection of A and B is denoted by  $A \cap B$  and is read as A intersection B. Symbolically  $A \cap B = \{x : x \in A \text{ and } x \in B\}$

(8)

$$\text{If } A = \{1, 2, 3, 4, 5\} \text{ and } B = \{3, 4, 5, 6, 7\} \\ \text{then } A \cap B = \{3, 4, 5\}$$



Venn diagram  
showing intersection  
of sets. +1

$$\text{Total persons} = 400$$

+1

$$\text{Smokers} = 100 \cdot \text{let it be set } A \text{ so } n(A) = 100$$

$$\text{Gum chewers} = 150 \cdot \text{let it be set } B \text{ so } n(B) = 150$$

$$\text{Both smokers \& gum chewers} = 75 = n(A \cap B)$$

We have to find out how many students are neither smokers nor gum chewers.

First we will find either smokers or gum chewers by using ~~addition~~.

$$n(A \cup B) = n(A) + n(B) - n(A \cap B) \quad +1$$

$$n(A \cup B) = 100 + 150 - 75$$

$$= 250 - 75$$

$$= 175 \quad +1$$

Therefore the students who are neither smokers nor gum chewers are

$$400 - 175 = 225$$

Total

= 6

(8)

Q4(i) "Statistics does not study individual".

~~Statistics is the science of~~  
 Collecting, analysis and interpreting  
 data and gives no importance to  
 individuals. A single or isolate  
 figure cannot be regarded as  
 statistics unless it is a part  
 of the aggregate of fact relating to  
 a field of enquiry. Statistical methods  
 do not give any recognition to an  
 object, or person or event <sup>and</sup> is isolation.

For e.g. death of 6 person  
 In a accident, 85% results of a  
 class of a school in a particular  
 year, will not amount to statistics  
 as they are not placed in a group of  
 similar items.

Q4(ii) Data given is

Class	frequency
0-10	13
10-20	25
20-30	40
30-50	28
50-80	30

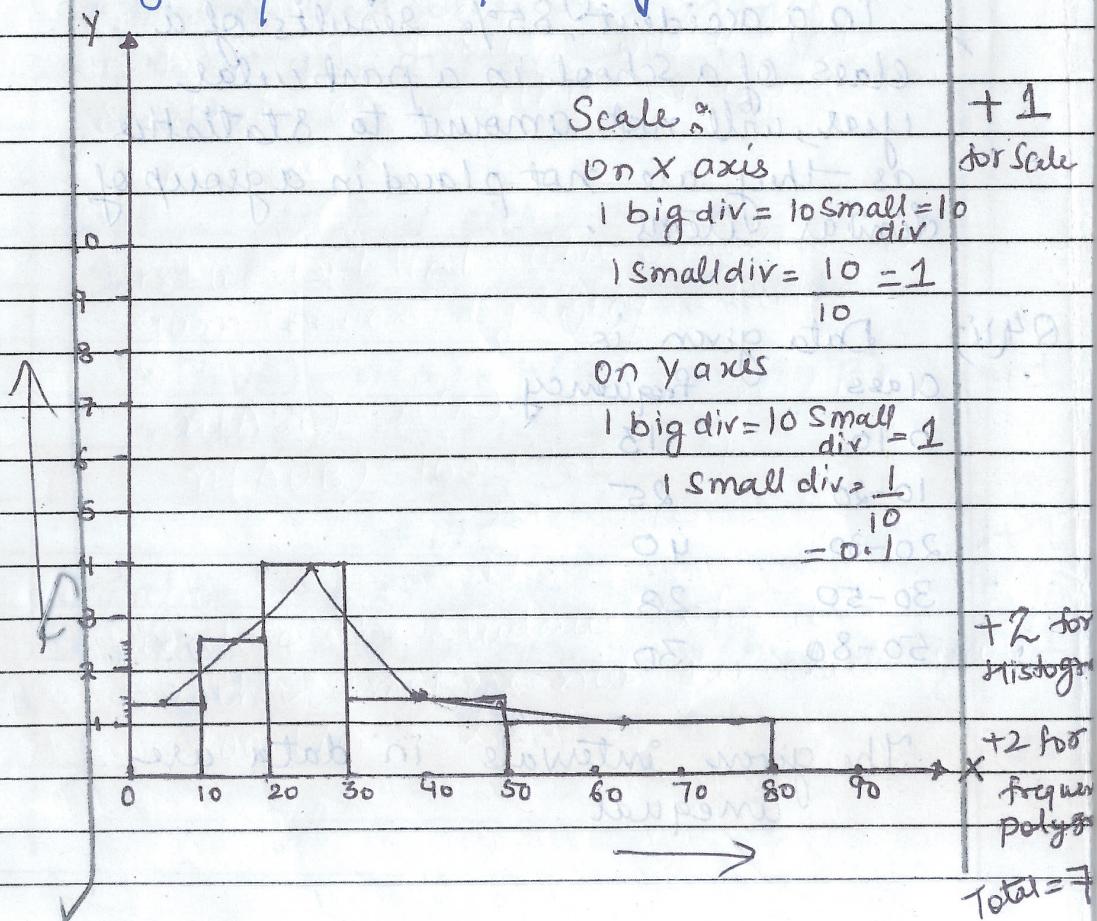
The given intervals in data are  
 unequal.

(10)

So first find frequency density  
 $= \frac{\text{frequency of class}}{\text{Class width}}$

	freq	Class width	Frequency density
0-10	10	10	$10/10 = 1.0$
10-20	25	10	$25/10 = 2.5$
20-30	40	10	$40/10 = 4$
30-50	28	20	$28/20 = 1.4$
50-80	30	30	$30/30 = 1$

Now plot the histogram taking rect height equal to freq. density.



(10)

4(i) Multiple graph: A multiple bar diagram is used for two or three dimensional comparison. For comparison of magnitudes of one variable in two or three aspects, or for comparison of magnitudes of ~~two~~ <sup>two</sup> three variables in ; a group of rectangles placed side by side is used. The bars are used ~~to~~, distinguished by shading or coloring to show different variables represented. +2

Given data is

Years	Exports	Imports
2005	24	9
2006	115	92
2007	84	92
2008	110	120
2009	130	183
2010	162	187.

Graph on next page.

(12)

Imports

Exports in million

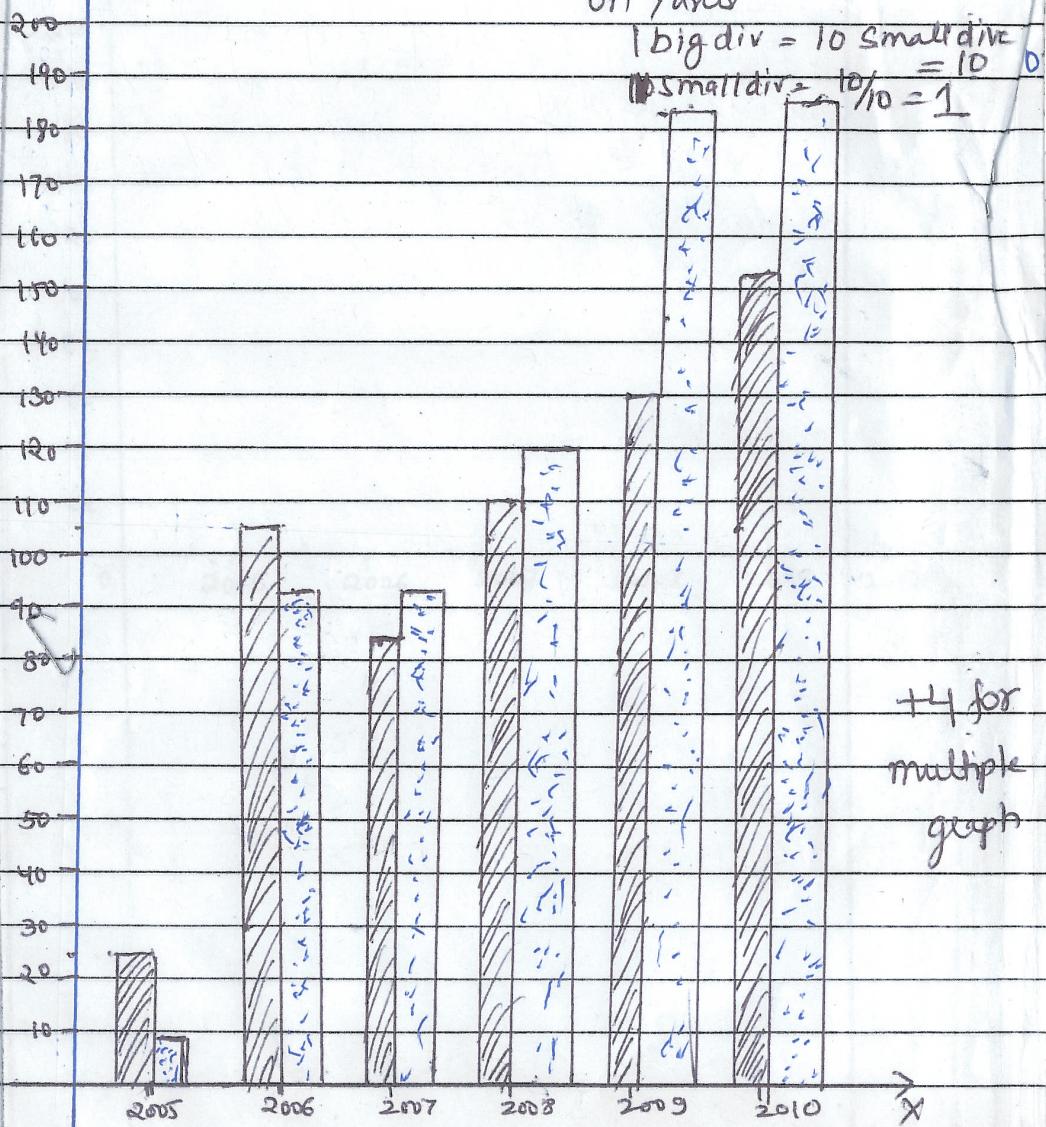
Scale - +1 for  
on x axis scale

1 big div = 1 year

On Y axis

1 big div = 10 small divs = 10

$$10 \text{ small divs} = \frac{10}{10} = 1$$



+4 for  
multiple  
graph

Years →

Total = 7

Q5(i) ABSOLUTE MEASURE	RELATIVE MEASURE	
① They are expressed in same units in which the original data is expressed	① It is the ratio of the percentage of absolute dispersion to an appropriate average	+1
② If the two or more series are expressed in different units it cannot be measured or compared on basis of Absolute measure	② Basic advantage of this measure is that two or more series can be compared with each other even if they are expressed in different terms	+1
③ Theoretically Absolute measure is better	Practically Relative measure is effective	+1

Total  
= 3

(a) formula for Average is	
$\frac{\text{Sum of observation}}{\text{No. of observation}} = \text{Avg.}$	+ 0.5
Sum of observation = Avg. $\times$ No. of observations - (2) Here no. of workers for both firms A + B	

(iii) are given

$$A = 100 \text{ workers}$$

$$B = 120 \text{ workers}$$

Avg monthly Salary is also given

$$A = 2500$$

$$B = 2800$$

We have to find out Total Salary first

So Total Salary paid by firm A

$$\begin{aligned} &= \text{Avg monthly Salary} \times \text{no. of workers} \\ &= 2500 \times 100 = 250000 \end{aligned}$$

$$\begin{aligned} \text{Similarly for } B &= 2800 \times 120 \\ &= 336000 \end{aligned}$$

Definitely on comparing we have Firm B paying more than A.

(b) For finding greater variability

We have to find Coefficient of

$$\text{Variation} = \frac{\text{S.D}}{\text{mean}} \times 100$$

$$\text{S.D} = \sqrt{\text{Variance}}$$

(15)

Variance of A = 200

$$S.D = \sqrt{200} = 14.1421$$

Mean = 2500

$$\text{Coefficient of variation} = \frac{14.1421 \times 100}{2500} + 1.5$$

$$= 0.5656\%$$

Variance of B = 250, Mean = 2800

$$S.D = \sqrt{250} = 15.811$$

Coefficient of variation

$$= \frac{15.811 \times 100}{2800}$$

$$= 0.5646\% + 1.5$$

Coefficient of variation of firm A

is higher so A shows greater variability in individual wages.

Total

= 7

Q5 (ii)

formula for median for grouped data is

$$l_1 + \frac{(N/2 - P.C.F)}{f} (l_2 - l_1) + 1$$

(16)

 $l_1$  = lower limit of Median class $l_2$  = upper limit of Median class $f$  = frequency of median class

pcf = preceding cumulative frequency

 $N$  = total frequency

Given data.

Class	freq.	C. frequency	
10-20	12	$12 = 12$	+2
20-30	30	$12+30=42$	
30-40	x	$42+x$	
40-50	65	$65+42+x=107+x$	
50-60	y	$107+x+y$	
60-70	25	$107+x+y+25=132+x+y$	
70-80	18	$132+x+y+18=150+x+y$	

Let the missing term be  $x$  &  $y$ .

$$\text{Total frequency} = N = 229$$

$$\text{So we have } 150+x+y = 229$$

$$\begin{aligned} \Rightarrow x+y &= 229 - 150 \\ &= 79 \end{aligned}$$

$$\text{Now formula Median} = 46$$

$$\frac{N}{2} = \frac{229}{2} = 114.5$$

Median class is 40-50

$$l_1 = 40 \quad l_2 - l_1 = 10 \quad f = 65$$

$$d_2 = 50 \quad p.c.f = 42+x$$

Now using the formula for median

(17)

$$M.M.d = l_1 + \frac{(N/2 - P.C.F)}{f} (l_2 - l_1)$$

$$46 = 40 + \frac{(114.5 - 42 - x) \times 10}{65}$$

$$46 = 40 + \frac{(72.5 - x) \times 10}{65} + 3$$

$$46 - 40 = (72.5 - x) \times 0.15$$

$$\Rightarrow 6 = (72.5 - x) \times 0.15$$

$$\Rightarrow 72.5 - x = \frac{6}{0.15}$$

$$\Rightarrow 72.5 - x = 40$$

$$\Rightarrow x = 72.5 - 40 \\ = 32.5$$

Now using relation (i)

$$i.e. x + y = 79 \quad +1$$

$$\text{we have } 32.5 + y = 79$$

$$y = \sqrt{79 - 32.5} \\ = 46.5.$$

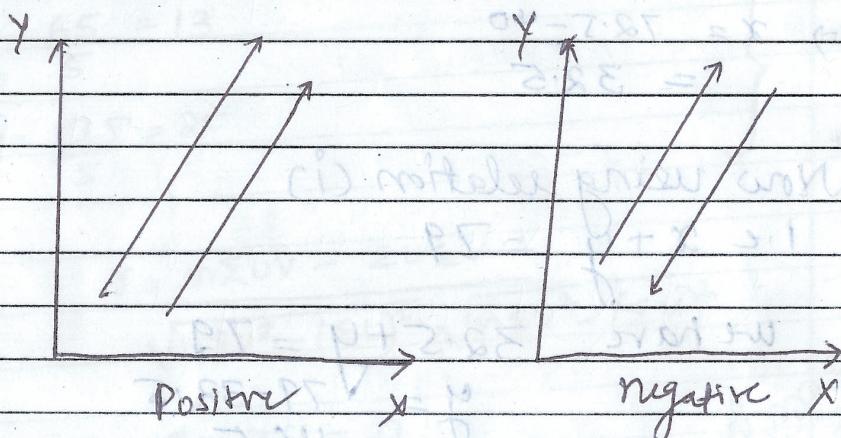
$$\text{So } x = 32.5 \text{ & } y = 46.5$$

Q6(i) Correlation  $\hat{=}$  Correlation is a statistical measure for finding out the degree of association between two or more variables. By association we mean

(19) the tendency of variables move together

Positive Correlation - Positive Correlation occurs when increase in one variable, +1 tends to be increase in the other variable. For e.g. Speed and distance, Height & Weight

Negative Correlation - Negative Correlation occurs when increase in one variable results in corresponding decrease of other variable, +1 For e.g. Speed & time



Q6(ii) Given data  $X$   $Y$

Arithmetic Mean = 36 85

S.D  $\underline{8}$

19

Correlation Coeff is 0.66

(a) Two regression eq. are

$$\begin{aligned}x \text{ on } y \quad (x - \bar{x}) &= b_{xy} (y - \bar{y}) - c_1 \\&\quad + 1 \\y \text{ on } x \quad (y - \bar{y}) &= b_{yx} (x - \bar{x}) + c_2\end{aligned}$$

$$\text{Given } \bar{x} = 36 \quad \bar{y} = 85 \quad \sigma_x = 11 \quad \sigma_y = 8 \\r = 0.66$$

$$b_{xy} = r \frac{\sigma_x}{\sigma_y} = 0.66 \times \frac{11}{8} = 0.907 \quad + 1$$

$$b_{yx} = r \frac{\sigma_y}{\sigma_x} = 0.66 \times \frac{8}{11} = 0.48$$

Putting the values above

$$x \text{ on } y : x - 36 = 0.91(y - 85) \\ \Rightarrow x = 0.91y - 41.35 \quad + 2.5$$

Similarly

$$y \text{ on } x : y - 85 = 0.48(x - 36) \\ \boxed{y = 0.48x + 67.72} \quad + 2.5$$

(b) Estimated value of  $x$  when  $y$  is 73

Using Regression line of  $x$  on  $y$

$$x = 0.91y - 41.35$$

$$\Rightarrow x = 0.91(75) - 41.35 = 26.9$$

Thus estimated value of  $x$  is 26.9  
when  $y$  is 75. +1

+1

total =

Q6 (i)  $r = (\bar{y} - \bar{x}) \text{ mod } = (\bar{x} - \bar{y}) \text{ max}$

Given data  $- x = \bar{x} - (\bar{y} - \bar{x}) \text{ max}$

$$x \quad y \quad u = x - \bar{x} \quad v = y - \bar{y} \quad u^2 \quad v^2 \quad uv$$

$$58 = 12.11 = x - 13 \quad 28 - 13 \quad 28 - 64 \quad 169 + 104$$

$$9 \quad 20 \quad -4 \quad -5 \quad 16 \quad 25 \quad 20$$

$$13 \quad 25 \quad 0 \quad 0 \quad 0 \quad 0 \quad 0 \quad +2$$

$$17 \quad 33 \quad 8 \quad 8 \quad 16 \quad 64 \quad 32 \quad \text{for } 3 \text{ points}$$

$$21 \quad 35 \quad 8 \quad 8 \quad 10 \quad 64 \quad 100 \quad 80$$

$$\sum x = 65 \quad \sum u = 0 \quad \sum v = 0 \quad \sum uv = 236$$

$$\bar{x} = \frac{65}{5} = 13$$

$$\bar{y} = \frac{125}{5} = 25$$

$$r = n \sum uv - \sum u \sum v$$

$$\sqrt{n \sum u^2 - (\sum u)^2} \quad \sqrt{n \sum v^2 - (\sum v)^2}$$

$$r = \frac{5 \times 236 - 0}{\sqrt{5 \times 160} - 0}$$

$$= \frac{\sqrt{5 \times 358} - 0}{\sqrt{5 \times 160} - 0}$$

$$r = \frac{236}{\sqrt{160} \sqrt{358}} = \frac{236}{12.64 \times 18.92} = 0.986 \quad +1$$

$$= \frac{236}{239.79} = 0.986$$

$$10 = 25 -$$

$$10 = 25 - 15 = 10$$