Model Answer
Code: AS-2604 Sub: Business Statistics

Q.N. 1 (i) A single or isolated figure, though numerically stated is not statistics. For example one accident, one birth, one death etc, are not statistics but the aggregate of facts of figures relating to accidents, births, deaths etc. over different times or places or subjects are statistics.

(ii) (a) Simple and rigid definition (b) Easy to understand (c) Simple and easy to compute (d) Based on all observations (e) least affected by fluctuations

(iii) Primary Data : The data collected from internal sources for any specific purpose and after preparing a plan are called primary data. For example to study the economic conditions of the persons living in a city, data obtained by studying these persons are internal data. Data which are obtained for the first time by the investigator for his purpose.

(iv) When the increase or decrease in one variable results in a corresponding increase or decrease in the same direction, the correlation is called to be positive or direct correlation For example relationship between price and supply.

(v) Fixed Base Index No - According to the this method a year is taken as the base price. prices during that year are taken as equal to 100 and prices of all following years are shown as percentage of the base year prices. changes of all the years are compared with one year / one point only.

while selecting base year it should be seen that there are no abnormal conditions in the base year.

(2)

(VI) Sum of the marks of 200 items

$200 \times 50 = 10000$

+ value reduced due to misread

$192 - 92 = 100$

$88 - 8 = 80$ $\quad 180$

10180

correct mean $= \frac{\Sigma x}{n} \quad \frac{10180}{200}$

$= 50.9$

(VII) obviously the marks of those students who failed will be less than 4, suppose these marks are a_1, a_2, a_3, a_4, a_5 in ascending order. Thus the marks of $5 + 10 = 15$ students in ascending order will be:

$a_1, a_2, a_3, a_4, a_5, 4, 5, 6, 6, 7, 7, 8, 8, 9, 9$

Hence

$M = \frac{n+1}{2}$ th item

$\frac{15+1}{2} = 16/2$

value of 8th item

$M = 6$ marks.

(VIII)

$$Q_3 = l_1 + \frac{l_2 - l_1}{f} \times q_3 - c$$

$$30 + \frac{40-30}{18} \times \frac{20-16}{}$$

$$30 + \frac{10}{18} \times 4$$

$$30 + \frac{40}{18}$$

$30 + 2.22 \quad Q_3 = 32.22$

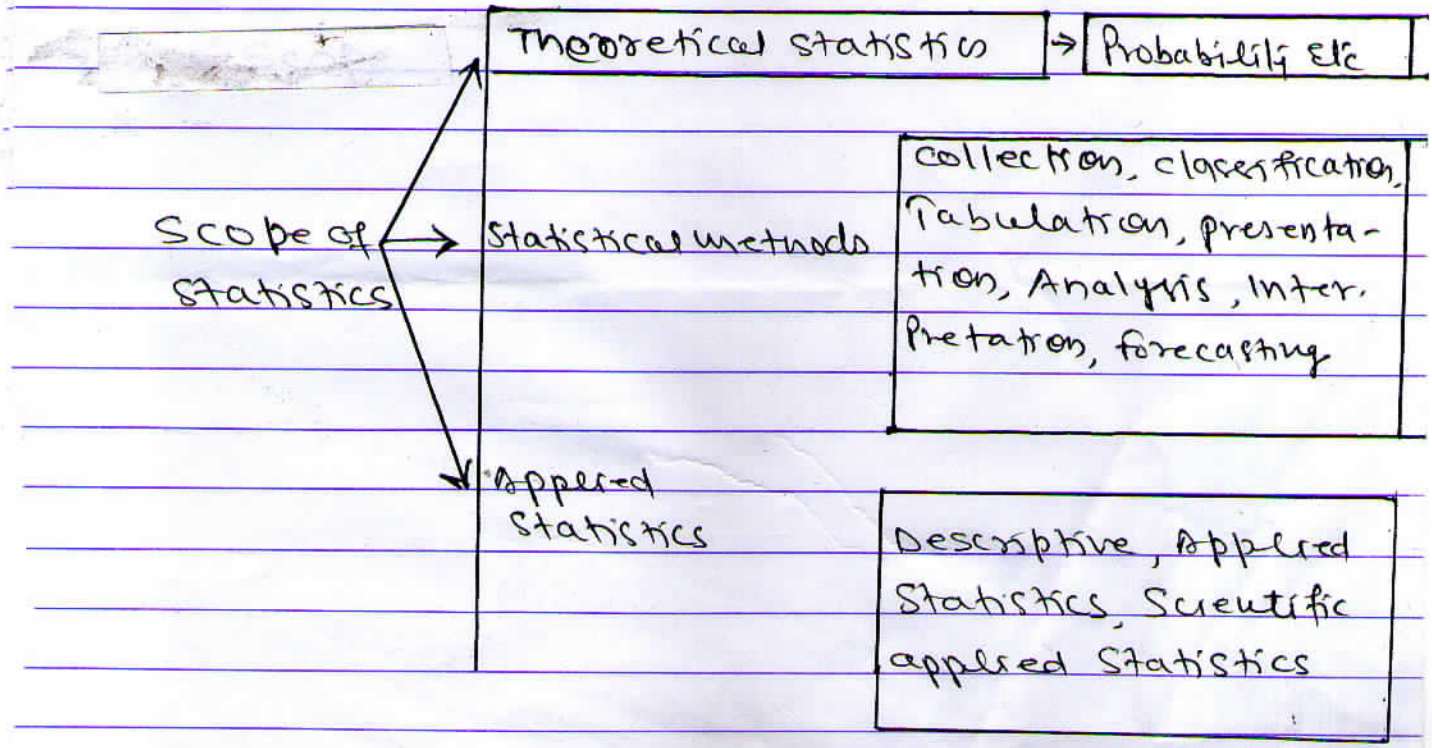
(ix) Density of Population = $\frac{\text{Population}}{\text{Area (sq km)}}$

$\frac{24000}{120}$	$\frac{75000}{150}$	$\frac{48000}{80}$	$\frac{40000}{50}$
200	500	600	800

(x)

Year	F.B. Index Nos	Conversion	
2001	200	~~100~~	100
2002	220	$\frac{220}{200} \times 100 =$	110
2003	240	$\frac{240}{220} \times 100 =$	109.09
2004	250	$\frac{250}{240} \times 100 =$	104.17

Q.N. 02 Defination of Statistics and Scope of Statistics and limitations:



Limitations : (I) Statistics does not study individual items

(II) Statical results may be misleading

(III) Statistics studies only quantitative data

(IV) Statistical results are true on the average

(V) It is not Only the method of study

(VI) It can be used by an expert in a proper way

(VII) Statistics is only the mean not an end.

Q.N. 03 Description of Index number which will include definations and meaning importance : (I) Simplifying the data (II) Comparative study (III) measuring purchasing power of money (IV) Reveal trends and tendencies (V) Usseful in deflating (VI) change in cost of living (VII) computing nation income (VIII) Essential control by Govt. (IX) Universal utility.

Q.N. 04

Sales (m)	Salesmen (f)	m.v.	dx (32-x)	fdx	c.f
15-20	3	17.5	0	0	3
20-25	6	22.5	5	30	9
25-30	8	27.5	10	80	17
30-35	10	32.5	15	150	27
35-40	7	37.5	20	140	34
40-45	4	42.5	25	100	38
45-50	2	47.5	30	60	40 (n)
	$\Sigma f = 40$			Σfdx 560	

05

$\bar{X} = a/x + \frac{\Sigma fdx}{\Sigma f}$

$= 17.5 + \frac{560}{40}$

$= 17.5 + 14$

$= \boxed{31.5}$

M = value of $\frac{n}{2}$ th item

value of $\frac{40}{2}$ th item

value of 20th item

median group = 30-40

$M = l1 + \frac{l2-l1}{f} \times \frac{m-c}{}$

$30 + \frac{35-30}{10} \times \frac{20-17}{}$

$30 + \frac{5}{10} \times 3$

$30 + \frac{15}{10}$

$30 + 1.5$

$\boxed{31.5}$

Q NO 05

m	f	m.v.	cf	$\lvert d_m \rvert$	$\lvert fdm \rvert$
				m = 14	
0-5	5	2.5	5	11.5	57.5
05-10	7	7.5	12	6.5	45.5
10-15	10	12.5	22	1.5	15.0
15-20	8	17.5	30	3.5	28.0
20-25	6	22.5	36	8.5	51.0
25-30	4	27.5	40(N)	13.5	54.0
	$\Sigma f = 40$				$\Sigma fdm = 251$

m = value of $\frac{N}{2}$ th item

value of $\frac{40}{2}$ th item

value of 20th item

median group 10-15

$m = l1 + \frac{l2-l1}{f} \times m-c$

$10 + \frac{15-10}{10} \times \frac{20-12}{}$

$10 + \frac{5}{10} \times 8$

$10 + \frac{40}{10}$

$10 + 4 = \boxed{M = 14}$

M.D.(m) = $\frac{\Sigma fdm}{\Sigma f}$

$\frac{251}{40}$

M.D = $\boxed{6.275}$

Coeff. of M.D. = $\frac{MD(m)}{M}$

$\frac{6.275}{14}$

$\boxed{.448}$

50

Q.N. 06 Let x = mid value of Age

y = Blindness per Lakh

mid value = 5 15 25 35 45 55

Blindness = $\frac{\text{No. of Blind}}{\text{Population}} \times \frac{100000}{} =$ 60 70 100 125 150 250

Table for calculating correlation :

Age x	Blindness y	dx $\frac{x}{a}=5$	dx^2	dy $\frac{x}{a}=60$	dy^2	$dxdy$
5	60	0	0	0	0	0
15	70	10	100	10	100	100
25	100	20	400	40	1600	800
35	125	30	900	65	4225	1950
45	150	40	1600	90	8100	3600
55	250	50	2500	190	36100	9500
$n=6$	$n=6$	Σdx 150	Σdx^2 5500	Σdy 395	Σdy^2 50125	$\Sigma dxdy$ 15950

$$r = \frac{\Sigma dxdy - \left(\frac{\Sigma dx \times \Sigma dy}{n}\right)}{\sqrt{\left[\Sigma dx^2 - \frac{(\Sigma dx)^2}{n}\right]\left[\Sigma dy^2 - \frac{(\Sigma dy)^2}{n}\right]}}$$

$$= \frac{15950 - \left(\frac{150 \times 395}{6}\right)}{\sqrt{\left[5500 - \frac{(150)^2}{6}\right]\left[50125 - \frac{(395)^2}{6}\right]}}$$

$$= \frac{15950 - 9875}{\sqrt{[5500 - 3750][50125 - 26004.17]}}$$

$$= \frac{6075}{\sqrt{[1750][24120.83]}}$$

$$= \frac{6075}{41.83 \times 155.31} \qquad \frac{6075}{6496.6}$$

$$r = .94$$

QN 07 Fisher's Index Number

Comm.	Base year Price P_0	Base year Qty Q_0	Current year Price P_1	Current year Qty Q_1	P_1Q_0	P_0Q_0	P_1Q_1	P_0Q_1
A	6	50	10	56	500	300	560	336
B	2	100	2	120	200	200	240	240
C	4	60	6	60	360	240	360	240
D	10	30	12	24	360	300	288	240
E	8	40	12	36	480	320	432	288
					ΣP_1Q_0	ΣP_0Q_0	ΣP_1Q_1	ΣP_0Q_1
					1900	1360	1880	1344

$$I = \sqrt{\frac{\Sigma P_1Q_0}{\Sigma P_0Q_0} \times \frac{\Sigma P_1Q_1}{\Sigma P_0Q_1}} \times 100$$

$$\sqrt{\frac{1900}{1360} \times \frac{1880}{1344}} \times 100$$

$$\sqrt{1.397 \times 1.398} \times 100$$

$$\sqrt{1.95} \times 100$$

$$1.396$$

OR

$$1.40 \times 100$$

$$I = 140$$

TRT = Time Reversal Test

$$\sqrt{\frac{\Sigma P_1Q_0}{\Sigma P_0Q_0} \times \frac{\Sigma P_1Q_1}{\Sigma P_0Q_1}} \times \sqrt{\frac{\Sigma P_0Q_1}{\Sigma P_1Q_1} \times \frac{\Sigma P_0Q_0}{\Sigma P_1Q_0}} = 1$$

$$= \sqrt{\frac{1900}{1360} \times \frac{1880}{1344}} \times \sqrt{\frac{1344}{1880} \times \frac{1360}{1900}} = 1$$

$$= \sqrt{\frac{1900}{1360} \times \frac{1880}{1344} \times \frac{1344}{1880} \times \frac{1360}{1900}} = 1$$

$$\sqrt{1} = 1$$

$$1 = 1$$

Multiple Bar Diagram

Scale of 1cm = 100 students