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47 (2) BUST-2-3

2015

BUSINESS STATISTICS

Paper : 2-3

Full Marks : 80

Time : Three hours

The figures in the margin indicate full marks for the questions.

1. Choose the correct alternative : $1 \times 10 = 10$

(a) The word 'statistics' seems to have been derived from the —

(i) Latin word 'status'

(ii) Italian word 'statista'

(iii) German word 'statistik'

(iv) All of the above

(b) Which is the best measure of central tendency?

(i) AM

(ii) GM

(iii) HM

(iv) Mode

Contd.

- (c) Which of the following is a unitless measure of dispersion ?
- (i) Quartile Deviation
 - (ii) Mean Deviation
 - (iii) Standard Deviation
 - (iv) Coefficient of variation
- (d) 'Sale of woolen cloths' is associated to —
- (i) Secular trend
 - (ii) Seasonal variation
 - (iii) Cyclical variation
 - (iv) Irregular variation
- (e) If A and B are two mutually exclusive events then what is the value of $P(A \cap B)$?
- (i) $P(A) \cdot P(B)$
 - (ii) 0
 - (iii) 1
 - (iv) Can't say
- (f) The number of parameters in binomial distribution is —
- (i) 0
 - (ii) 1
 - (iii) 2
 - (iv) 3

(g) In case of Poisson distribution —

(i) mean > variance

(ii) mean < variance

(iii) mean = variance

(iv) Can't say

(h) In case of normal distribution —

(i) $MD = \frac{5}{4}SD$ (ii) $MD = \frac{4}{5}SD$

(iii) $MD = \frac{3}{2}SD$ (iv) $MD = \frac{2}{3}SD$

(i) If C is any constant then $var(C) = ?$

(i) C^2 (ii) C

(iii) 0 (iv) 1

(j) The correlation coefficient between income and expenditure is considered to be —

(i) Negative (ii) Zero

(iii) Positive (iv) None

2. Answer the following: (**any five**) $2 \times 5 = 10$

- (a) If AM = 25 and Median = 20 then find Mode
- (b) If $E(X) = 5$; find $E(3X + 6)$
- (c) Bring out the fallacy of the statement —
"The mean of a binomial distribution is 8 and SD is 3"
- (d) Under what circumstances, a binomial distribution tends to Poisson distribution ?
- (e) Mention *two* sources of secondary data.
- (f) If $b_{yx} = 1.6$ and $b_{xy} = 0.4$; find r
- (g) If $P(A) = \frac{1}{2}$, $P(B) = \frac{1}{3}$ and $P(A \cap B) = \frac{1}{4}$

then find the value of $P(A \cup B)$.

3. Answer the following: (**any four**) $4 \times 5 = 20$

- (a) The means of two samples of sizes 60 and 90 respectively are 52 and 48, and the standard deviations are 9 and 12. Obtain the mean and S.D. of the sample of size 150 obtained by combining two samples.

- 10
d
- (b) Write a short note on skewness and Kurtosis.
- (c) Two persons X and Y appear in an interview for two vacancies in the same post. The probability of X 's selection is $\frac{1}{5}$ and that of Y 's selection is $\frac{1}{3}$, what is the probability that exactly one of them will be selected?
- (d) The numbers of road accidents on a highway during a month follows a Poisson distribution with mean 6. Find the probability that in a certain month number of accidents will be (i) not more than 2 (ii) between 2 and 4 (given $e^{-6} = 0.0025$)
- (e) Write a short note on scatter diagram
- (f) Find the correlation from the following data —

$$n=100, \sum X = 280, \sum Y = 60,$$

$$\sum X^2 = 2384, \sum Y^2 = 1017, \sum XY = 438$$

- (g) From the following series of observations, calculate 3 yearly weighted moving averages with the weights 1, 2, 1 respectively

Year :	1	2	3	4	5	6	7
Value :	2	4	5	7	8	10	13

4. Answer the following : **(any five)** $8 \times 5 = 40$

- (a) Calculate mean and standard deviation from the following set of data :

Salary (in '000 Rs) :	20-25	25-30	30-35	35-40
No. of persons :	2	3	11	20
	40-45	45-50	50-55	
	32	25	7	

- (b) Explain the differences between a schedule and a questionnaire

- (c) The following results are given

	x	y
AM	36	85
SD	11	8

co-efficient of correlation = 0.66

Find (i) The *two* regression equations

(ii) Estimate the value of x when $y=75$

(d) Explain survey

(e) Calculate from

Marks in statistics

Marks in Accounts

Marks in statistics

Marks in Accounts

(f) Find

Year :

Production :

(g)

(h)

(d) Explain the advantages of sample survey over complete census.

(e) Calculate rank correlation coefficient from the following data —

Marks in statistics : 68 64 75 50 64

Marks in Accountancy : 62 58 68 45 81

Marks in statistics : 80 64 40 75 55

Marks in Accountancy : 60 70 48 68 50

(f) Fit a linear trend to the following data and estimate the trend values by the method of least squares —

Year : 2001 2002 2003 2004 2005 2006 2007

Production: 80 90 92 83 94 99 104

(g) Explain the various components of time series.

(h) How many male workers in a factory have a daily wage between (i) ₹ 480 and ₹ 680, and (ii) more than ₹ 720 if the mean daily wage is ₹ 500 and S.D. is ₹ 100 and the number of workers is 10,000 if the daily wage of the workers is assumed to be normally distributed

Given Z : -1 1.8 2.2

Area : 0.3413 0.4641 0.4861