6/12/19 E

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 8256 **J**

Unique Paper Code : 22415301

Name of the Paper : Business Statistics

Name of the Course : **Commerce : GE for Hons.**

Semester : III

Duration : 3 Hours Maximum Marks : 75

Instructions for Candidates

1. Write your Roll No. on the top immediately on receipt of this question paper.
2. Attempt **All** questions.
3. Use of simple calculator is allowed.
4. Log tables will be supplied on demand.

1. (a) Calculate Karl Pearson's coefficient of skewness from the following data

GMAT score (more than):	0	100	200	300	400	500	600	700	800
No. of Students:	150	140	100	80	80	70	30	14	0

(10)

P.T.O.

(b) The mean and standard deviation of two brands of light bulbs are given below :

	Brand 1	Brand 2
Mean	800 hours	770 hours
Standard deviation	100 hours	60 hours

Calculate a measure of relative dispersion for the two brands and interpret the results. (5)

OR

(a) Different averages serve different purposes but simple mean is ideal average that can serve all purposes. Comment. (4)

(b) The median and Q_1 of a normal distribution are 89 and 75.5 respectively. Calculate standard deviation. (5)

(c) An analysis of the monthly salaries paid to employees in two companies belonging to same industry provides the following results.

No. of Employees	1200	1500
Average monthly salary	12000 (Rs)	9000 (Rs)
Standard deviation	200 (Rs)	225 (Rs)

Find the combined average monthly salary and combined standard deviation of salaries of two companies. (6)

2. (a) A departmental store gives inservice training to its salesmen which is followed by a test. The following data gives the test scores and sales made by the salesmen.

Test scores	14	19	24	21	26	22	15	20	19
Sales ('000Rs.)	31	36	48	37	50	45	33	41	39

Fit regression equations to the above data and find the expected sales from a salesman having a test score of 23. Also calculate the coefficient of correlation between the test scores and sales. (10)

(b) What is Regression? How is it different from correlation? (5)

P.T.O.

OR

(a) You are given following information :

$N = 5, \overline{X} = 10, \overline{Y} = 20,$

$\sum(X-4)^2 = 100$, $\sum(Y-10)^2 = 160$, $\sum (X-4)(Y-10) = 80$

Obtain the two regression equations and the value of X when Y = 30. (7)

(b) From the data given below calculate the coefficient of correlation between the Sales (X) and Advertisement (Y).

X \ Y	30-50	50-70	70-90	Total
0-5	10	6	2	18
5-10	3	5	4	12
10-15	4	7	9	20
Total	17	18	15	50

(8)

3. (a) Explain the various methods of sampling. (8)

(b) The following figures relates to the prices and quantities of certain commodities. Construct Laspeyre's, Paasche's and Fisher's index numbers.

	2014		2015	
Commodities	Price	Quantity	Price	Quantity
A	30	50	32	50
B	25	40	30	35
C	18	50	16	55

(7)

OR

(a) What is Cost of Living Index? How is it useful? (5)

(b) Calculate Fisher's Ideal Index for the following data and show that it satisfies both Time Reversal Test and Factor Reversal Test.

Commodities	Base Year		Current Year	
	Price	Quantity	p_1q_1	q_1
A	2	8	24	6
B	5	10	30	5
C	4	14	50	10
D	2	19	26	13

(10)

P.T.O.

4. (a) The export of cotton clothes from 2013 to 2018 is given below. Fit a linear trend to the exports data and estimate the expected exports for the year 2022.

Year	2013	2014	2015	2016	2017	2018
Export in (crores of Rs)	11	16	13	18	22	20

Also convert the trend equation into a monthly trend equation. (10)

(b) What are seasonal variations? Explain any one method of measuring seasonal variations. (5)

OR

(a) Explain the various components of time series. (6)

(b) Obtain quadratic trend equation by method of least squares from the data given below and estimate sales for 2017.

Year	2010	2011	2012	2013	2014
Sales (Lakhs)	70	74	80	86	90

(9)

5. (a) What are the different properties of normal distribution? (5)

(b) Suppose that the number of claims for missing baggage average 6 per day. Find the probability that on a given day, there will be :

(i) No claim

(ii) Exactly six claims

(iii) At least two claims (5)

(c) Find the probability that in a family of 4 children there will be :

(i) At least 1 girl

(ii) At least 1 boy and 1 girl (5)

OR

(a) Explain Bayes Theoram. (4)

(b) A problem of statistics is given to two students A and B. The odds in favor of A solving the problem are 6 to 9 and against B solving the problem are 12 to 10. If A and B both attempt, find the probability of the problem being solved. (5)

P.T.O.

(c) A workshop produces 2000 articles per day. The average weight of a unit is 130 kg with a standard deviation of 10 kg. Assuming normal distribution, how many units are expected to weigh

(i) less than 142 kg

(ii) between 120 kg and 140 kg (6)