

in statistics is $9/16^{\text{th}}$ of the variance of marks in Accountancy. Find the mean marks of statistics and the coefficient of correlation between the marks in the two subjects.

- (c) Explain the difference between skewness and kurtosis. Pearson's coefficient of skewness for a data distribution is 0.5 and coefficient of variation is 40%. Its Mode is 80. Find the mean and median of the distribution.

- (d) Five observations of two variables are as follows :

X	Y
4	50
6	50
11	40
3	60
16	30

- (i) Develop a scatter diagram with x on the horizontal axis.
- (ii) What relationship among x and y is indicated by the scatter diagram?
- (iii) Compute the sample covariance and sample correlation coefficient.

(1000)

[This question paper contains 8 printed pages.]

Your Roll No.....

Sr. No. of Question Paper : 6063

H

Unique Paper Code : 2924001202

Name of the Paper : Statistics for Business (GE)

Name of the Course : B.A. (H) Business Economics
(NEP: UGCF-2022)

Semester : II

Duration : 3 Hours

Maximum Marks : 90

Instructions for Candidates

- Write your Roll No. on the top immediately on receipt of this question paper.
- Attempt **all** questions. Choice is available within each question.
- Use of simple calculator is permitted
- Required statistical table is provided at the end of this paper.

1. Attempt any **three** parts : (6×3)

- (a) During one year, the ratio of milk prices per litre to bread prices per loaf was 3 whereas during next year, the ratio was 2

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- (i) Find the arithmetic mean of these ratios for two year period.
- (ii) Find the arithmetic mean of the ratios of bread prices to milk prices for the two year period.
- (iii) Discuss the suitability of the geometric mean for averaging ratios.
- (b) Calculate the average speed per hour in the following cases:
- (i) An automobile driver covers half the distance at speed of 40 km per hour and the remaining distance at speed of 10 km per hour.
- (ii) An automobile driver travels 240 km at speed of 40 km per hour and 20 km at a speed of 10 km per hour.
- (c) In a frequency distribution the coefficient of skewness based on quartiles is 0.6. If the sum of the upper and lower quartiles is 100 and the median is 38. Find the value of the upper quartile.
- (d) Draw ogives (both less than and more than) from the following data :

Marks	0-10	10-20	20-30	30-40	40-50	50-60
No. of students	10	20	30	50	40	30

Group	Expenditure	Group Index
Food	1400	180
Clothing	?	150
House Rent	?	100
Fuel and Lighting	560	110
Miscellaneous	630	80

- (c) Define the Time reversal test and Factor reversal test for index numbers. Show that Fisher's method of constructing index numbers satisfies both.

5. Attempt any two parts : (6×2)

- (a) (i) If the coefficient of correlation between two variables is zero, does it mean that the variables are unrelated? Comment.
- (ii) The mean closing price of stock A, over the past year is Rs. 58 with a standard deviation of Rs. 15. For stock B the mean is Rs. 27 and the standard deviation is Rs. 9. Which of the two stock prices vary more.
- (b) For 50 students of a class the regression equation of marks in Statistics (X) on the marks in Accountancy (Y) is $3Y - 5X + 180 = 0$. The mean marks of Accountancy is 44 and variance of marks

- (f) The general procedure of testing hypothesis requires a researcher to adopt several steps. Describe in brief.

4. Attempt any **two** parts : (6×2)

- (a) From the following data, compute the consumer price index for the current year using Aggregate Expenditure Method :

Commodity	Base year		Current Year	
	Price (Rs)	Quantity (kg)	Price (Rs)	Quantity(kg)
A	1	6	5	8
B	2	7	4	7
C	3	8	3	6
D	4	9	2	5

Mr X was getting a salary of Rs. 10,000 in the base year, what should his salary be the current year if his standard of living is to remain the same? If he is getting a salary of Rs. 11,000 in the current year, how much should he have received to maintain his former standard of living?

- (b) A textile worker in the city of Mumbai earns Rs. 3,500 per month. The cost of living index for a particular month is given as 136. Using the following information, find out the amount of money the worker spent on house rent and clothing:

2. Attempt any **four** parts : (6×4)

- (a) A bag contains 30 balls numbered from 1 to 30. One ball is drawn at random. Find the probability that the number of the drawn ball will be a multiple of (i) 3 or 5 (ii) 4 or 7
- (b) An MBA graduate applies for a job in two firms A and B. The probability of his being selected in firm A is 0.7 and being rejected in firm B is 0.3. What is the probability that the graduate will be selected in exactly one of the firms if the probability of at least one of his applications being rejected is 0.4?
- (c) 30% people of a country are found to be diabetic. 60% of the diabetic people have high blood pressure whereas 90% of the non-diabetic people don't have high blood pressure. Suppose a randomly selected person :
- (i) happens to have high blood pressure, what is the probability that the person doesn't have diabetes?
- (ii) doesn't have high blood pressure, what is the probability that the person has diabetes?

(d) Records show that the probability is 0.00002 that a car will have a flat tyre while driving over a certain bridge. Use the poisson probability distribution to determine the probability that among 20,000 cars driven over this bridge, not more than one will have a flat tyre (given $e^{0.2} = 0.819$, $e^{0.4} = 0.670$)

(e) Assume that the height of soldiers is normally distributed and the mean height of soldiers is 68.22 inches with a variance of 10.8 inches. How many soldiers in a regiment of 1000 would you expect to be over six feet tall?

3. Attempt any **four** parts : (6×4)

(a) An automatic machine was designed to pack exactly 2.0 kg of Vanaspati. A sample of 100 tins was examined to test the machine. The average weight was found to be 1.94 kg with standard deviation 0.10 kg. Is the machine working properly? Test at 5% level of significance.

(b) A sample of size 100 is found to have a mean of 5 cm. Can it reasonably be regarded as a simple random sample from a large population with mean 4 cm and standard deviation 3 cm? Test at 5% level of significance.

(c) The mean life of a sample of 400 tube lights produced by a company is found to be 1570 hours with a standard deviation of 150 hours. Test the hypothesis that the mean lifetime of the tube lights produced by the company is 1600 hours against the alternative hypothesis that it is greater than 1600 hours. Use 1% level of significance.

(d) An investor has developed a new, energy efficient mower engine. He claims that engine will run continuously for 5 hours (300 minutes) on a single gallon of regular gasoline. Suppose a simple random sample of 50 such engines is tested and the engines run for an average of 295 minutes with a standard deviation of 20 minutes. Test the null hypothesis that the mean run time is 300 minutes against the alternative hypothesis that the mean run time is not 300 minutes. Use a 0.05 level of significance.

(e) A sample of 100 tyres is taken from a lot. The mean life of tyres is found to be 39,350 kilometres with a standard deviation of 3260. Could the sample come from a population with mean life of 40,000 kilometres? Also obtain 99% confidence limits within which the mean life of tyres is expected to lie.