

Mid-West University  
**Examinations Management Office**  
 Surkhet, Nepal  
**Final Examinations -2079**

Bachelor level/ B.Sc / 1<sup>st</sup> Semester  
 Time: 3hrs  
**Subject : Descriptive Statistics ( STAT415/315)**

Full Marks : 60  
 Pass Marks : 30

*Candidates are required to give their answer in their own words as far as practicable. The figures in the margin indicate full marks.*

**Group-A**

**Long answer question [4x6=24]**

1. What is histogram? Draw histogram and frequency polygon of the following distribution.

Age	10-15	15-20	20-25	25-30	30-35	35-40
No. of person	2	5	6	7	4	3

[1+3+2]

2. Derive the formula of mode for continuous series using graphical method. [6]
3. Show that if deviation are small compared with the mean (M) so that  $(\frac{x}{M})^3$  and higher power of  $\frac{x}{M}$  may be neglected,

a)  $G=M(1-\frac{\sigma^2}{2M^2})$       b)  $M^2-G^2=\sigma^2$

Where M, G and  $\sigma$  are respectively arithmetic mean, geometric mean and standard deviation of variable x. [6]

**OR**

What do you mean by kurtosis of a distribution? Show that the Pearson's Beta coefficients satisfy the inequality  $\beta_2 \geq \beta_1 + 1$ . [1+5]

4. How scatter diagram help in studying the correlation between the variables? Show that correlation coefficient is independent of change of origin and scale. [2+4]

**Group-B**

**Short answer question [6x4=24]**

5. What is primary and secondary source of data? What are the different method of collecting primary data. [2+2]
6. Show that the weighted A.M of the first 'n' natural numbers whose weights are equal to the corresponding numbers is equal to  $\frac{2n+1}{3}$ .
7. The expenditure of 100 families is given as below;
- | Expenditure (Rs '000') | 20-29 | 30-39 | 40-49 | 50-59 | 60-69 |
|------------------------|-------|-------|-------|-------|-------|
| No. of families        | 8     | ?     | 40    | ?     | 10    |
- The median for the distribution is Rs. 44. Calculate missing frequencies.
8. Define standard deviation. Discuss its mathematical properties.
9. In what propose we use coefficient of variation? Show that variance of n natural numbers is  $\frac{n^2-1}{12}$ . [1+3]
10. First four moments of a distribution about the value 4 are 1.5, 20, -18 and 60. Discuss nature of the distribution.

**OR**

Show that correlation coefficient lies between -1 and +1.

**Group-C**

**Very Short answer question [6x2=12]**

11. Write down the major function of statistics.
12. What do you understand cross-sectional and time series data?
13. The mean of the 120 item was 40. Later on it was found that two items were wrongly taken as 182 and 8 instead of 82 and 80. Find the correct mean.
14. What are the roles of measure of dispersion in descriptive statistics?
15. Explain concept of skewness graphically.
16. Write down the properties of Karl Pearson's coefficient of correlation.

**THE END**