# LOYOLA COLLEGE (AUTONOMOUS), CHENNAI – 600 034

**B.B.A. & B.COM.** DEGREE EXAMINATION – **BUSINESS ADMIN. & CORPO. SEC.**

**SECOND** SEMESTER – **APRIL 2016**

**ST 2105 - FUNDAMENTALS OF STATISTICS**

Date: 26-04-2016 Dept. No. Max. : 100 Marks
Time: 01:00-04:00

## SECTION -A

**Answer ALL the questions**. **(10 x 2 = 20 Marks)**

1. Define the term statistics.
2. Explain pie diagram to represent data.
3. Define Arithmetic mean.
4. Calculate harmonic mean for the following data100,200,300,400
5. Define mean deviation.
6. Find the Standard deviation of 10 natural numbers.
7. Write a short note on Bowley's coefficient of Skewness
8. Explain the concept of correlation between two variables.
9. State the regression equation of x on y and y on x.
10. State the merits of finding the trend usingmethod of least squares.

## SECTION B

**Answer any FIVE questions**: **(5 X 8 = 40 Marks)**

11. Discuss the various diagrams in presenting statistical data.

12.Draw a Percentage Bar Diagram for the following data:

| *Expenditure* | *Company A* | *Company B* | *Company C* |
|---|---|---|---|
| Wages | 2160 | 2600 | 2700 |
| Materials | 540 | 700 | 810 |
| Taxation | 360 | 200 | 360 |
| Profits | 360 | 300 | 360 |
| Administration | 180 | 200 | 270 |

13. Compute the Geometric Mean of the following data:

| *x* | 30 | 33 | 34 | 38 | 40 | 45 |
|---|---|---|---|---|---|---|
| *f* | 9 | 10 | 7 | 6 | 4 | 11 |

14. Two samples of size 40 and 50 have the same mean 53, but different standard deviations 19 and 18 respectively. Find the standard deviation of the combined sample.

15. 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 is38.Find the value of the upper quartile.

16.Find the correlation coefficient between production and sales of a factoryfrom the data given below:

| *Production (in tonnes)* | 50 | 55 | 63 | 67 | 65 | 60 | 61 |
|---|---|---|---|---|---|---|---|
| *Sales (in thousands)* | 35 | 36 | 42 | 51 | 54 | 53 | 55 |

17. Fit a straight line trend for the following series. Estimate the value for 1985.

| Year | 1978 | 1979 | 1980 | 1981 | 1982 | 1983 | 1984 |
|---|---|---|---|---|---|---|---|
| Production of Steel in million tonnes | 125 | 128 | 133 | 135 | 140 | 141 | 143 |

18. Describe the different methods of measuring Seasonal Variation

## SECTION C

**Answer any TWO questions:** **(2 X 20 = 40 Marks)**

19.(a) Calculate Mean, Median and Mode and verify empirical relation:

| Class Interval | 1 – 10 | 11 – 20 | 21 – 30 | 31 – 40 | 41 - 50 | 51 – 60 | 61 – 70 | 71 – 80 |
|---|---|---|---|---|---|---|---|---|
| Frequency | 10 | 12 | 14 | 9 | 7 | 6 | 5 | 13 |

(b) The mean height of 35 male workers in a factory is 71 cm. and the mean height of 25 female workers in the same factory is 68 cm. Find the combined mean height of 60 workers in the factory.

**(15 +5)**

20. (a) Calculate Mean Deviation about Mean for the following data:

| *Class Interval* | 4 – 8 | 8 – 12 | 12 – 16 | 16 – 20 | 20 – 24 | 24 – 28 | 28 – 32 | 32 – 36 | 36 – 40 |
|---|---|---|---|---|---|---|---|---|---|
| *Frequency* | 6 | 10 | 18 | 30 | 15 | 12 | 10 | 6 | 3 |

(b) Find the Quartile Deviation and its Coefficient for the following distribution:

| *Class Interval* | 0 – 10 | 10 – 20 | 20 – 30 | 30 - 40 | 40 – 50 | 50 – 60 |
|---|---|---|---|---|---|---|
| *Frequency* | 8 | 20 | 25 | 30 | 12 | 5 |

**(10 + 10)**

21.(a) Ten competitors in a beauty contest are ranked by three judges in the Following order:

| *Judge 1* | 1 | 6 | 5 | 10 | 3 | 2 | 4 | 9 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|---|
| *Judge 2* | 3 | 5 | 8 | 4 | 7 | 10 | 2 | 1 | 6 | 9 |
| *Judge 3* | 6 | 4 | 9 | 8 | 1 | 2 | 3 | 10 | 5 | 7 |

Use the rank correlation coefficient to determine which pair of judges has the nearest approach to common tastes in beauty.

(b) Calculate the Regression equations of X on Y from the following data and estimate X when Y = 26.

| *X* | 10 | 12 | 13 | 17 | 18 | 20 | 24 | 30 |
|---|---|---|---|---|---|---|---|---|
| *Y* | 5 | 6 | 7 | 9 | 13 | 15 | 20 | 21 |

**(10 + 10)**

22. Calculate the Seasonal Indices by the method of Link Relatives:

| *Quadrant* / *Year* | *I* | *II* | *III* | *IV* |
|---|---|---|---|---|
| *2009* | 51 | 53 | 58 | 58 |
| *2010* | 55 | 52 | 53 | 62 |
| *2011* | 50 | 51 | 52 | 54 |
| *2012* | 54 | 48 | 55 | 54 |

**(20)**

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