

Reg. No.

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BCMCMC 158

**Credit Based Second Semester B.Com. Degree
Examination, May/June 2016
(2014-15 Batch Onwards)**

COMMERCE

Business Statistics and Mathematics – II

Time : 3 Hours

Max. Marks : 80

- Instructions :** 1) *Non programmable calculators only* are allowed.
2) *Working notes should be shown whenever needed.*

SECTION – A

Answer any four of the following :

(4×4=16)

1. Define correlation. Explain positive and negative correlation with example.
2. What is regression ? State the properties of regression co-efficients.
3. What is a time series ? Explain seasonal variations in the time series with examples.
4. A sum of money at simple interest amounts to ₹ 1,020 and ₹ 1,105 in 4 years and 6 years respectively. Find the rate of interest.
5. The cash price of an article sold is ₹ 11,400. The trade discount and cash discount are 20% and 5% respectively. Find the marked price.
6. A bill with a face value of ₹ 7,500 is due 3 months from now. It is discounted with a bank at 16% p.a. Find banker's gain.

SECTION – B

Answer any four of the following :

(4×8=32)

7. Calculate Karl Pearson's co-efficient of correlation from the following.

| x | y |
|-----|-----|
| 140 | 180 |
| 180 | 220 |
| 200 | 240 |
| 190 | 230 |
| 250 | 300 |
| 210 | 250 |
| 220 | 260 |
| 240 | 280 |
| 260 | 310 |
| 280 | 340 |

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8. Calculate Spearman's co-efficient of rank correlation between x and y.

| x | y |
|----|----|
| 55 | 47 |
| 98 | 25 |
| 95 | 32 |
| 81 | 37 |
| 75 | 25 |
| 61 | 40 |
| 59 | 39 |
| 55 | 40 |
| 75 | 40 |
| 55 | 45 |

9. If the regression equations are $3x - 2y + 1 = 0$ and $3x - 8y + 13 = 0$, find \bar{x} , \bar{y} and correlation co-efficient.

10. Compute four yearly moving averages from the following data.

| Year | Sales |
|------|-------|
| 2003 | 290 |
| 2004 | 280 |
| 2005 | 285 |
| 2006 | 310 |
| 2007 | 320 |
| 2008 | 305 |
| 2009 | 310 |
| 2010 | 330 |
| 2011 | 340 |
| 2012 | 321 |
| 2013 | 320 |
| 2014 | 340 |

11. At certain rate of interest compounded monthly, a sum doubles in 3 years.

Find :

- a) The nominal rate of interest b) Effective rate of interest.

12. Find the equated due date of payment of the following bills.

- a) ₹ 4,000 drawn on May 12 for 4 months
- b) ₹ 3,000 drawn on June 11 for 2 months
- c) ₹ 9,000 drawn on May 10 for 5 months
- d) ₹ 8,000 drawn on July 18 for 3 months
- e) ₹ 6,000 drawn on July 25 for 2 months



SECTION – C

Answer any two questions :

(2×16=32)

13. From the data given below, calculate correlation co-efficient between the cost of advertisement and sales proceeds. Also calculate co-efficient of determination.

| Sales (lakhs) (₹) \ Cost ('000 ₹) | 25-29 | 30-34 | 35-39 | 40-44 |
|-----------------------------------|-------|-------|-------|-------|
| 12-15 | 6 | 3 | 2 | 2 |
| 15-18 | 5 | 8 | 4 | 3 |
| 18-21 | 3 | 2 | 6 | 4 |
| 21-24 | 2 | 8 | 10 | 12 |

14. From the data given below, find :

- a) The two regression equations.
- b) The two regression co-efficients.
- c) The most likely age of husband when wife's age is 30 years.
- d) The most likely age of wife when husband's age is 35 years.
- e) Correlation co-efficient between age of husband and age of wife using regression co-efficients.

Age of husband (yrs.)

Age of wife (yrs.)

22

18

23

20

23

21

24

20

26

21

27

22

27

23

28

24

30

25

30

26



15. From the following, fit a linear equation by the method of least squares.

| Year | Value |
|------|-------|
| 2007 | 80 |
| 2008 | 90 |
| 2009 | 92 |
| 2010 | 94 |
| 2011 | 83 |
| 2012 | 99 |
| 2013 | 92 |
| 2014 | 104 |

Find the trend values and estimate the trend value for the year 2016.

16. A bill was drawn on January 12, 2014 for a period of 5 months and discounted on February 2nd 2014 at 14% p.a. If the banker made a gain of ₹ 24, calculate the face value of the bill. Also calculate the discounted value and present value of the bill.