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S.No. 905

12USTA11

(For the candidates admitted from 2012–2013 onwards)

B.B.A. DEGREE EXAMINATION, NOVEMBER 2017.

Second Semester

BUSINESS MATHEMATICS AND STATISTICS — II

Time : Three hours

Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL questions.

1. Define annuity.
2. What is meant by sinking fund?
3. What is constants?
4. Write a note on left-hand limit.
5. What is meant by positive correlation?
6. Write any two uses of regression analysis.
7. Define time series.

8. What is seasonal variation?
9. What do you mean by cost of living index number?
10. What is factor reversal test?

SECTION B — (5 × 5 = 25 marks)

Answer ALL questions.

11. (a) Mr. Somasundaram deposits a total of ₹ 45,000 in two different banks which give 10% and 15% interest respectively. If the amounts repayable by the two banks at the end of 10 years are to be equal, determine the individual amounts of deposit.

Or

- (b) A bank paid ₹ 2,574 for a bill of ₹ 2,628 drawn on 15<sup>th</sup> May at 6-months date. On what day the bill was discounted if the rate of interest is 10% per annum?

12. (a) Differentiate the following with respect to  $x$ .  
 $(3x^2 + 4x - 5)^3$ .

Or

- (b) Find  $\lim_{x \rightarrow 3} \frac{x^2 + x - 12}{x^2 - x - 6}$ .

13. (a) From the following data, compute the co-efficient of correlation between  $x$  and  $y$ .

	X	Y
Sum of squares of deviations from the arithmetic mean	8250	724
Sum of products of deviations of $X$ and $Y$ from respective means		2350
No. of pairs of observations		10

Or

- (b) For the data given below, compute regression equation of  $Y$  on  $X$ :

$X$ : 10 12 13 12 16 15

$Y$ : 40 38 43 45 37 43

14. (a) Using three year moving averages determine the trend and short term fluctuation.

Year : 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015

Production: 21 22 23 25 24 22 25 26 27 26

Or

- (b) Fit a straight line trend to the following time series:

Year :	2010	2011	2012	2013	2014	2015
Production :	72	75	74	78	83	82

15. (a) Define index number and state its uses.

Or

- (b) Compute price index based on the simple average of price relatives by using arithmetic mean:

Commodity : A B C D E F G H

Price in 2015 (in ₹) : 40 120 140 130 60 70 65 75

Price in 2016 (in ₹) : 60 140 170 135 100 80 75 80

### SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. A sum of ₹ 1,000 is to be paid at the end of every year for a period of 5 years at the rate of 10% per annum compound interest. If the first instalment is paid at the end of the first year, how much amount will be accrued to the credit of the depositor? What is the present worth?

17. The total cost function of a firm is given by  $C = 0.04q^3 - 0.9q^2 + 10q + 10$  find (a) average cost and marginal cost and (b) value of  $q$  at which average variable cost is minimum.

18. Compute the co-efficient of correlation between  $X$ -advertisement expenditure and  $Y$ -sales.

$X$ : 10 12 18 8 13 20 22 15 5 17

$Y$ : 88 90 94 86 87 92 96 94 88 85

19. Calculate the seasonal indices from the following data:

Year	Quarter			
	I	II	III	IV
2012	78	66	84	80
2013	76	74	82	78
2014	72	68	80	70
2015	74	70	84	74
2016	76	74	86	82

20. Using the following data, construct Fisher's ideal index and show that it satisfies Factor Reversal Test and Time Reversal Test.

Commodity	Price in ₹		Quantity	
	Base year	Current year	Base year	Current year
A	6	10	50	56
B	2	2	100	120
C	4	6	60	60
D	10	12	30	24
E	8	12	40	36