

F.Y.B.A. - Sem II

6/5/19

2-30-5.30

Pages - 2

FYBA SEM-II

6/5/19

40

Paper / Subject Code: 96060 / Statistics : Paper I

QP Code : 51678

Duration: 3 Hours

Maximum Marks: 100

N.B.: 1. All the questions are compulsory.  
2. Use of Calculator is allowed.

Q.1) A) Correct the following if necessary, giving justification for each: [10]

- (1)  $r=1$  indicates weak positive correlation. [02]
- (2) The two regression lines do not intersect at all. [02]
- (3) Least square method is used to fit only non-linear curve to the data. [02]
- (4) The observations in time series are independent of each other. [02]
- (5) Fisher's index number is called ideal index number. [02]

B) Answer in one sentence: [10]

- (1) Give interpretation when correlation coefficient is 0. [02]
- (2) What is interpolation? [02]
- (3) What are short term components of time series? [02]
- (4) What are the methods of determining seasonal variation? [02]
- (5) State the formula of Paasche's quantity index number. [02]

Q.2) Attempt any Two sub-questions: [20]

- (1) Define scatter diagram and draw any four different types of scatter diagrams for different degrees of correlation between bivariate variables. [10]
- (2) How is correlation coefficient measured? Discuss the following types of correlation:  
i) Positive Correlation      ii) Negative Correlation      iii) Perfect Correlation [10]
- (3) Discuss the effect of change of origin and change of scale on regression coefficients. [10]
- (4) Describe the method of curve fitting using least square method for the following curves:  
i)  $y=a+bx+cx^2$       ii)  $y=ab^x$  [10]

Q.3) Attempt any Two sub-questions: [20]

- (1) Explain the method of moving average for the determination of trend with its advantages and disadvantages. [10]
- (2) Explain the additive and multiplicative models of time series. State the uses of time series in detail. [10]
- (3) Explain the concepts of seasonal variation and cyclical variation with suitable examples. [10]
- (4) Derive normal equations used to determine the least squares line of best fit ' $y=a+bx$ ' and parabolic curve  $y_t=a+bt+ct^2$ . [10]

Q.4) Attempt any Two sub-questions: [20]

- (1) Explain the following with respect to index number: [10]

[Turn over

- i) Shifting of base      ii) Splicing on index number series
- (2) Show that Fisher's index number satisfies: [10]  
i) Time reversal test      ii) Factor reversal test
- (3) Define 'Cost of living index number'. Also explain the methods for construction of cost of living index numbers. [10]
- (4) Construct price index numbers using Laspeyre's, Paasche's, Fisher's and Marshal-Edgeworth's methods. [10]

Commodity	$p_0$	$q_0$	$p_1$	$q_1$
A	8	10	10	11
B	10	9	12	9
C	16	16	20	17

**Q.5) Attempt any Four sub-questions:** [20]

- (1) Explain: [05]  
i) Spurious Correlation      ii) Coefficient of determination
- (2) Give the method to calculate rank correlation when the ranks are repeated. [05]
- (3) Distinguish between secular trend and seasonal variations. [05]
- (4) Explain the following methods of measurement of trend: [05]  
i) Graphical Method      ii) Semi-average method
- (5) Discuss the uses of index numbers. [05]
- (6) Explain the term 'real income'. Also explain how to calculate it. [05]
- (7) Explain the two types of weighted index numbers. [05]