(c) Write a brief note on the construction and importance of Cost of Living Index Number. 20

8. (a) Define Price Elasticity of Demand. Write a brief note on Laws of supply and demand. 20

(b) Write about Pigou's Method of estimating demand functions from time series data and from Family Budget data. 30

(c) Explain two stage least square method in Economic Forecasting. 10

SECTION–V

9. (a) Write about Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR) in measuring the Population Growth. 20

(b) Write about fitting of Logistic Growth Curves by the method of three selected points. 10

(c) Define Age Specific Fertility rate, General Fertility rate, and Total Fertility Rate and discuss their Merits and Limitations. 30

10. (a) Discuss about Normalized score and T-scores on a Test. 20

(b) Discuss the methods determining Test reliability used in Psychometric Study tools. 30

(c) Define abridged life table. Explain the Reed-Merrell Method of its construction. 10

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Paper—II

Time : Three Hours] [Maximum Marks : 300

Note :— (i) Answers must be written in English.

(ii) Number of marks carried by each question are indicated at the end of the question.

(iii) Part/Parts of the same question must be answered together and should not be interposed between answers to other questions.

(iv) The answer to each question or Part thereof should begin on a fresh page.

(v) Your answers should be precise and coherent.

(vi) Attempt **five** questions selecting any three Sections of choice.

(vii) If you encounter any typographical error, please read it as it appears in the text-book.

SECTION–I

1. (a) Describe various steps in conduction of Sample survey. 10

(b) Find Variance of Sample mean in SRSWR and SRSWOR and show that $V(\bar{y}_n)_{SRSWOR} \leq V(\bar{y}_n)_{SRSWR}$ 20

(c) Show that $V(\bar{y}_{st})_{OPT} \leq V(\bar{y}_{st})_{prop}$ 20

(d) Show that Sample size (n_i) is Proportional to N_iS_i in Proportional allocation of stratified random sampling. 10

2. (a) Compare the salient features of CRD, RBD and LSD. 30

(b) Estimate the single missing value in Randomized Block Design. 15

(c) Write about Balanced Incomplete Block Design and Partial Incomplete Block Designs. 15

SECTION–II

3. (a) Explain how do you interpret the process control using X-Bar and Range Charts. 20

(b) Write the procedure of constructing the control charts for proportion of defectives and number of defects per unit. 20

(c) Describe the importance of OC, ASN and ATI curves in Sequential Sampling Plans. 20

4. (a) Explain the role of Cumulative Distribution function and Probability density function in Reliability and Hazard functions. 20

(b) Explain how an exponential reliability function can be obtained from the assumptions of Constant Failure rate. 20

(c) Write need of studying Redundancy in Reliability. Also write the types of redundancy. 20

SECTION–III

5. (a) Mention a brief note on different models in Inventory problems. 15

(b) The grinding machine is having the cost of Rs. 6100/-, the wastage cost is Rs. 100/- ; a historical data reveals that the maintenance costs are Rs. 100, 250, 400, 600, 900, 1250, 1600 and 2000 for the years 1st, 2nd, 3rd, 4th, 5th, 6th, 7th and 8th years respectively. When the machine is suggested to be replaced ? 15

(c) Write the Algorithm for finding Optimal Transportation cost while writing the procedure for finding the Basic feasible solution by Vogel's approximation Method. 20

(d) Write a Fortran program for finding variance of a discrete data. 10

6. (a) A book seller is obtaining the stock from two agencies namely A and B worth Rs. 4500/- and Rs. 5000/- respectively. The agency A supplies the product Books, Pens, Plastic Boxes and School Bags per unit cost Rs. 20/-, Rs. 12/-, Rs. 10/- and Rs.25/- respectively; similarly agency B supplies the product Books, Pens, Plastic Boxes and School Bags per unit cost Rs. 18/-, Rs. 16/- , Rs. 14/-, and Rs.22/- respectively. The book seller is selling the Unit of Book, Pen, Plastic Box and School Bag at the rate of Rs. 22/-, Rs.18/-, Rs.15/- and Rs.28/- respectively. Formulate a Linear programming problem for finding the Number of Books, Pens, Plastic Boxes and School Bags. 25

(b) Write the algorithm of any suitable method for solving a linear programming problem with artificial variables. 15

(c) Describe the difference between Software and Hardware and write their role in Computer systems. 20

SECTION–IV

7. (a) Mention the Components of Time Series data Analysis. Explain the Method of Moving Averages for measuring the Trend for Odd and Even Periodicity. 20

(b) Mention the special features and Limitations with Laspeyre's and Pasche's Index numbers and mention the remedial measures suggested by Marshall–Edgewoth, Walsh, Drowbish-Bowley and Fisher. 20