

POST-GRADUATE COURSE

Term End Examination — December, 2009

M.Com.

BASIC STATISTICAL CONCEPT & TOOLS

PAPER VII

Time — 2 hours Full marks—50  
(Weightage of marks—80%)

Special credit will be given for accuracy and relevance in the answer. Marks will be deducted for incorrect spelling, untidy work and illegible handwriting. The weightage for each question has been indicated in the margin.

Group A

Answer any two questions : 12½×2=25

- 1.(a) Compute appropriate measures of central tendency and dispersion from the given frequency distribution of time taken by 100 workers to compute a job :

Time (min) :	-12	13-15	16-18	19-21	22-24	25-27	28-
No. of Workers :	4	16	22	28	15	9	6

- (b) Fluctuation in daily sales of a product is given below :  
Compute standard deviations.

Sales : 523, 572, 531, 611, 597, 543, 562, 575, 583.  
4

- 2.(a) The ranking of 8 individuals at the start and on the finish of a training programme are as follows :

Individuals :	A	B	C	D	E	F	G	H
Rank before :	5	2	8	1	4	6	3	7
Rank after :	4	5	7	3	2	8	1	6

Calculate Spearman's rank correlation and comment.  
4

- (b) In a trivariats distribution :

Means :  $\bar{X}_1 = 28.02$   $\bar{X}_2 = 4.91$   $\bar{X}_3 = 594$

S. D. B :  $S_1 = 4.4$   $S_2 = 1.1$   $S_3 = 0.80$

Correlations :  $r_{12} = 0.80$   $r_{23} = -0.56$   $r_{13} = -0.40$

Obtain the regression line of  $X_1$  on  $X_2$  and  $X_3$  and estimate the value of  $X_1$  when  $X_2 = 6.0$  and  $X_3 = 650$ . 8½

- 3.(a) You are given the following data :

Factory A      Factory B

No. of employees :                      150                      100

Ave. monthly salary (Rs.) :            3,200                      3,650

Variance :                                  296                                  356

Obtain the average monthly salaries of employees and standard deviation in the two factories taken together.  
4½

- (b) Using suitable interpolation formula find  $f(24)$  from the following data :

X :            5            10            15            20            25

f(x) :        1.0            1.6            3.8            8.2            15.4

- 4.(a) Explain the degree and type of correlation on the basis of scatter diagram. What are the important properties of simple regression ? 6½

- (b) Find whether attributes A and B are independent, positively associated or negatively associated in the cases :

(i)  $N = 1000$ ,  $f_A = 470$ ,  $f_B = 620$ ,  $f_{AB} = 320$

(ii)  $f_A = 490$ ,  $f_{AB} = 294$ ,  $f_{\alpha} = 570$ ,  $f_{\alpha\beta} = 380$

3+3

(3)

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## Group B

Answer any two questions :  $12\frac{1}{2} \times 2 = 25$ 

- 5.(a) Discuss various problems in the construction of index number.  $4\frac{1}{2}$
- (b) Determine the price index number for 2008 with 2000 as the base year using Fisher's ideal index :  $(6)$

Commodity	Year 2000	Year 2008		
	Quantity	Price (Rs.)	Quantity	Price (Rs.)

A	5	36	7	42
B	7	75	10	84
C	6	64	6	90
D	2	7	9	15

8

- 6.(a) Describe different components of time series with illustration.  $4\frac{1}{2}$
- (b) Fit a quadratic trend equation by the least square method from the following data :
- Year : 2000 '01 '02 '03 '04 '05 '06 '07 '08  
Sales : 86 77 64 70 79 85 93 106 121
- Hence estimate sales for 2010.  $8$

7. The sample means ( $\bar{X}$ ) and range (R) for 12 samples of size 5 each are given below. Draw mean chart and range chart and comment on the state of control :

Sample No. :	1	2	3	4	5	6
$\bar{X}$ :	29	25	17	19	23	26
R :	4	7	3	8	5	6
Sample No. :	7	8	9	10	11	12
$\bar{X}$ :	22	27	23	20	25	28
R :	7	4	6	2	5	8

 $12\frac{1}{2}$ 

P.T.O.

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(4)

8. Write short notes on any four :  $4 \times 3 + \frac{1}{2}$
- (a) Relative dispersion.
- (b) Multiple correlation.
- (c) Yule's coefficient of association.
- (d) Consumer price index number.
- (e) Moving average method.
- (f) Control chart for attribute and variable.
- (g) Tests of index number formula.