POST-GRADUATE COURSE

Term End Examination :

December, 2014 / June, 2015

COMMERCE

Paper-VII : Basic Statistical Concepts & Tools

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 : 15 × 2 = 30

1. a) State the merits and demerits of Geometric Mean.

   b) The frequency distribution of expenditure of 2500 families is given below :

Expenditure (Rs.'000) :	30-49	50-69	70-89	90-109	110-129
No. of families :	125	?	1250	?	125

   The mean and median of the distribution are equal to Rs. 77,500. Determine the missing frequencies. 6 + 9

2. a) Prove that the simple correlation coefficient varies between + 1 and – 1.

   b) Distinguish between $r_{23\cdot1}$ and $b_{23\cdot1}$.

   c) Given : $b_{31\cdot2} = 0\cdot82$ and $r_{13\cdot2} = 0\cdot65$,

   Obtain $b_{13\cdot2}$. 7 + 4 + 4

3. a) The mode of a certain frequency curve $y = f(x)$ is attained at x = 9·1 and the value of the frequency function $f(x)$ for x = 8·9, 9·0 and 9·3 are respectively equal to 0·30, 0·35 and 0·25. Calculate the approximate value of $f(x)$ at the mode.

   b) Derive Newton's forward interpolation formula. 7 + 8

4. a) What do you understand by independence of attributes ?

   b) 300 people of German and French nationalities were interviewed for finding their preference for music of their own language. The following facts were gathered :

   (i) Out of 100 German nationals, 60 liked music of their own language whereas 70 French nationals out of 200 liked German music.

   (ii) Out of 100 French nationals, 55 liked music of their own language and 35 German nationals out of 200 liked French music.

   Using Yule's coefficient of association, state whether Germans prefer their own music in comparison with Frenchmen. 5 + 10

Group - B

Answer any *two* questions. 10 × 2 = 20

5. a) What is cost of living index ?

   b) Compute price index number of the following data by using (i) simple aggregate, (ii) weighted aggregate (iii) simple arithmetic mean of price relatives and (iv) weighted arithmetic mean of price relatives :

Commodity :	*A*	*B*	*C*	*D*
Quantity (kg) :	5	3	4	7
Price in 2009 :	30	40	20	50
Price in 2014 :	45	40	25	60

2 + (2 + 2 + 2 + 2)

6. a) Fit an exponential trend equation to the following data :

Year :	2008	2009	2010	2011
Production ('000 tons)	30	32	31	33

2012	2013	2014
32	34	33

Estimate the production in 2020.

   b) State the different methods of measurement of seasonal variation. (5 + 2) + 3

7. a) The following data relate to the life (in hours) of 7 samples of 6 electric bulbs each, drawn at intervals of one hour from a production process :

Sample No.	**Life (in hours)**					
1	520	582	565	655	729	580
2	401	483	425	490	560	570

(continue .....)

3	562	601	585	472	521	553
4	545	525	472	527	534	645
5	395	885	569	542	550	530
6	532	652	527	482	583	445
7	529	610	570	593	662	434

Ascertain :

(i) Upper and lower control limits for mean chart.

(ii) Upper and lower control limits for range chart.

Also interpret the results.

   b) Narrate the usefulness of S.Q.C. (3 + 3) + 4

8. Write short notes on any *four* of the following: $2\frac{1}{2} \times 4 = 10$

   a) Mode

   b) Coefficient of variation

   c) Zero correlation

   d) Spearman's rank correlation

   e) Chain index

   f) Components of time series

   g) TQM.