3 SEM TDC ECO M 2

2016

(November)

ECONOMICS

(Major)

Course : 302

(Statistical Methods in Economics)

Full Marks : 80

Pass Marks : 32 (Backlog) / 24 (2014 onwards)

Time : 3 hours

The figures in the margin indicate full marks for the questions

1. Answer the following as directed : 1×8=8

(a) A normal, smooth, continuous and perfectly symmetrical bell-shaped curve is called

(i) platykurtic

(ii) leptokurtic

(iii) mesokurtic

(iv) skewed curve

(Choose the correct answer)

(b) If r is greater than 6 times the probable error ($r > 6$ PE), then

(i) correlation in two variables is significant

(ii) there is no evidence of correlation in two variables

(iii) correlation should not be considered at all marked

(iv) None of the above

(Choose the correct answer)

(c) The factor reversal test is satisfied, if

$$P_{01} \times P_{10} = \frac{\Sigma p_1 q_1}{\Sigma p_0 q_0}$$

(Write True or False)

(d) Mention one demerit of mean deviation.

(e) Two or more events are said to be equally likely, if the chance of their happening is

(i) equal

(ii) favourable

(iii) exhaustive

(iv) independent

(Choose the correct answer)

(f) The regression analysis which studies more than two variables at a time is called _____ regression.

(Fill in the blank)

(g) For calculation of index numbers, the best average is

(i) arithmetic mean

(ii) geometric mean

(iii) harmonic mean

(iv) median

(Choose the correct answer)

(h) The error associated with accepting a hypothesis when it is false is known as

(i) type I error

(ii) type II error

(iii) type III error

(iv) None of the above

(Choose the correct answer)

2. Write short notes on any *four* of the following (**within 150 words** each) : 4×4=16

(a) Conditions for an ideal measure of dispersion

(b) Systematic sampling

(c) Method of least squares

(d) Sample space and events

(e) Use of index numbers for deflating other series

3. (a) Discuss the relationship among mean, median and mode. Which one is the best average and why? 4+7=11

Or

(b) (i) The mean marks of 100 students were found to be 40. Later on it was discovered that a score of 53 was misread as 83. Find the correct mean. 5

(ii) Compute the mean deviation from mean for the following series : 6

Marks	0–10	10–20	20–30	30–40	40–50
No. of students	5	8	15	16	6

4. (a) Write brief notes on the following : 5+3+3=11

(i) Distinction between sampling and census

(ii) Formulation of null hypothesis

(iii) Critical region

(Continued)

Or

(b) The following table gives the classification of 500 workers according to sex and nature of work. Test whether nature of work is independent of the sex of the worker : 11

Nature of work → / *Sex* ↓	*Skilled*	*Unskilled*	*Total*
Males	140	120	260
Females	110	130	240
Total	250	250	500

[The value of χ^2 for 1 degree of freedom at 5% level of significance is 3·84.]

5. *(a)* *(i)* A coin is tossed 6 times. What is the probability of getting at least 2 heads? 5

(ii) Mention the properties of normal distribution. 6

Or

(b) If one card is drawn from a well-shuffled pack of card, what is the probability of getting—

(i) either a king or a queen;

(ii) either a spade or a diamond;

(iii) neither an ace nor a jack;

(iv) either black or red? 3+3+3+2=11

6. *(a)* Find Karl Pearson's coefficient of correlation between the following values of X and Y and compute the probable error : 9+3=12

X	78	89	96	69	59	79	68	61
Y	125	137	156	112	107	136	123	108

Or

(b) The following data are given for marks in Economics (Y) and Statistics (X) in a certain year. Determine the two regression equations, and also find the probable marks in Economics of a candidate who obtained 50 marks in Statistics : 5+5+2=12

Mean marks in Statistics—39·5

Mean marks in Economics—47·6

Standard deviation of marks in Statistics—10·8

Standard deviation of marks in Economics—16·9

r between marks in Statistics and Economics—0·42

(Continued

7. *(a)* Calculate Fisher's ideal index from the following data and prove that it satisfies both the time reversal and factor reversal tests : 5+3+3=11

Commodity	*2014*		*2015*	
	Price	*Expenditure*	*Price*	*Expenditure*
A	8	80	10	120
B	10	120	12	96
C	5	40	5	50
D	4	56	3	60
E	20	100	25	150

Or

(b) *(i)* Explain the problems of construction of index numbers. 5

(ii) The following are the index number of prices (base 1991 = 100). Shift the base from 1991 to 2001 : 6

Year	2000	2001	2002	2003	2004	2005	2006	2007
Index numbers	140	200	210	230	250	260	280	300

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