

**3 SEM TDC ECO M 2**

**2 0 1 7**

( November )

**ECONOMICS**

( Major )

Course : 302

**( Statistical Methods in Economics )**

Full Marks : 80

Pass Marks : 32/24

Time : 3 hours

*The figures in the margin indicate full marks  
for the questions*

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

(a) Mean deviation can be computed based on

(i) arithmetic mean

(ii) median

(iii) mode

(iv) All of the above

( Choose the correct answer )

- (b) To ascertain the significance of the value of  $r$ , the technique of probable error is used.

( Write True or False )

- (c) Those events, the occurrence of which prevents the probability of the other to occur, are known as

(i) mutually exclusive events

(ii) equally likely events

(iii) exhaustive events

(iv) dependent events

( Choose the correct answer )

- (d) The value of Spearman's rank correlation coefficient ( $\rho$ ) ranges from

(i) 0 to +1

(ii) -1 to +1

(iii) -1 to 0

(iv) None of the above

( Choose the correct answer )

(e) Mention one limitation of harmonic mean.

(f) Fisher's ideal index does not satisfy

(i) time reversal test

(ii) factor reversal test

(iii) unit test

(iv) circular test

( Choose the correct answer )

(g) In case of normal distribution, the coefficient of skewness is \_\_\_\_\_.

( Fill in the blank )

(h) The error of rejecting a true or correct hypothesis is

(i) type-I error

(ii) type-II error

(iii) sampling error

(iv) probable error

( Choose the correct answer )

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

- (a) Properties of regression coefficients  
 (b) Poisson distribution  
 (c) Testing of hypothesis  
 (d) Fixed-base and Chain-base index numbers  
 (e) Method of least squares

3. (a) Define skewness and kurtosis. Discuss the different methods of measuring skewness. 2+2+7=11

Or

- (b) From the following distribution, calculate the missing frequencies if  $N = 60$  and median = 40 : 11

Marks	0-10	10-30	30-60	60-80	80-90
Frequency	5	?	?	8	2

4. (a) Explain the advantages of sampling over census. Write notes on (i) stratified random sampling and (ii) systematic random sampling. 5+3+3=11

Or

- (b) In an experiment on 164 people with colds, half of them were given a certain drug and half of them were given sugar pills. The patients' reactions to the treatment are recorded in the following table :

	<i>Helped</i>	<i>Harmed</i>	<i>No effect</i>	<i>Total</i>
<i>Drug</i>	52	10	20	82
<i>Sugar pills</i>	44	12	26	82
<i>Total</i>	96	22	46	164

On the basis of this data, can it be concluded that there is a significant difference in the effect of the drug and sugar pills? [The value of  $\chi^2$  for 2 degrees of freedom at 5% level of significance is 5.09]

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5. (a) Explain with example the concepts of the following : 2×6=12
- (i) Sample space
  - (ii) Equally likely events
  - (iii) Mutually exclusive events
  - (iv) Exhaustive events
  - (v) Favourable events
  - (vi) Random experiment

Or

(b) There are 3 economists, 4 engineers, 2 statisticians and 1 doctor. A committee of 4 members from them is selected. Find the probability that the committee has—

(i) one of each kind;

(ii) at least one economist;

(iii) the doctor as a member and three others.

$$4+4+4=12$$

6. (a) Define rank correlation. Calculate the rank correlation coefficient between poverty and overcrowding from the following data : 2+9=11

Poverty	17	13	15	16	6	11	14	9	7	12
Overcrowding	36	46	35	24	12	18	27	22	2	8

Or

(b) From the data given below :

Marks in Economics	25	28	35	32	31	36	29
Marks in Statistics	43	46	49	41	36	32	31

Find (i) the two regression equations,  
(ii) the most likely marks in Statistics, when the marks in Economics is 30.

$$5+5+1=11$$

( 7 )

7. (a) Discuss the use of index numbers for deflating other series. Also mention the problems of constructing index numbers. 6+5=11

Or

- (b) With the help of the following data, construct Fisher's ideal index, and show that it satisfies both time reversal and factor reversal tests : 5+3+3=11

Commodity	Base Year		Current Year	
	Price (₹)	Quantity	Price (₹)	Quantity
A	6	50	10	56
B	2	100	2	120
C	4	60	6	60
D	10	30	12	24
E	8	40	12	36

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