

Reg. No.:



Name:

University of Kerala

U8891

Second Semester FYUGP Degree Examination, April 2025

Discipline Specific Core Course

STATISTICS

UK2DSCSTA107 - BASIC STATISTICS II

Academic Level: 100-199

Time: 2 Hours(120 Mins)

Max. Marks: 56

Part A.6 Marks:Time 5 Minutes.(Cognitive Level :Remember(RE)/Understand(UN)) Objective Type.1 mark each, Answer all questions

Qn No.	Question	CL	CO
1	When will you say that two attributes A and B are completely disassociated?	RE	1
2	Name the theorem whcih states that the distribution of sample means will be approximately normal for large sample sizes,regardless of the population distribution.	RE	4
3	Explain the situation were two attributes A and B are negatively associated	UN	1
4	Which of the following is the purpose of Tchebychev's inequality? Options : A)To calculate probabilities exactly B)To estimate population parameters C)To provide a bound of a probability D)To determine the value of a parameter	UN	4
5	Decrease in the death rates in the past many years is a _____ trend.	UN	3
6	State Dorbish Bowley's index number in terms of Laspeyre's and Paasche's index numbers.	UN	2

Part B.10 Marks.Time:20 Minutes (Cognitive Level:Understand(UN)/Apply(AP))Two-three sentences.2 marks each.Answer all questions

Qn No.	Question	CL	CO
7	Define Laspayer's price index number	UN	2
8	Define convergence in probability.	UN	4
9	Demonstrate the situations where Paasche's index number satisfy time reversal test.	AP	2
10	Check whether A and B are independent or not:- N=300, (A)=48, (B)=100, (AB)=16	AP	1
11	A meteorologist records daily rainfall over 15 years. Explain why this is a time series	AP	3

Part C.16 Marks.Time:35 Minutes.(Cognitive Level :Apply(AP)/Analyse(AN))Short Answer.4 marks each, Answer all 4 questions,choosing among options * within each question

Qn No.	Question	CL	CO
12	A)	AP	3, 3

Qn No.	Question	CL	CO
	A retail business experiences a significant surge in sales every December due to holiday shopping. Which time series component best captures this pattern? Explain your reasoning. OR B) How does a seasonal variation differ from secular trend in a time series? Explain with a suitable example.		
13	A) Explain all four weighted index number with suitable formula OR B) X is a random number with mean 3 and variance 2, Find h such that $P\{ X-3 <h\} > 0.99$, clearly stating suitable inequality.	AP	2, 4
14	A) Examine whether A and B are independent, positively or negatively associated in the following data: (A)=490 (AB)=294 (α)=570 and (α B)=380. OR B) Under what conditions does Laspeyres' price Index Number satisfy the factor reversal test?	AN	1, 2
15	A) Differentiate between a secular trend and cyclical fluctuations. OR B) What are the assumptions involved in CLT? State CLT.	AN	3, 4

Part D.24 Marks. Time: 60 Minutes. (Cognitive Level :Analyse(AN)/Evaluate(EV)/Create(CR)) Long Answer 6 Marks each. Answer all 4 questions choosing among options * within each question

each answer all 4 questions choosing among options within each question																															
Qn No.	Question									CL	CO																				
16	A) Define time series. Mention its uses. Explain the components of a time series. OR B) In an anti-malaria campaign in a certain area quinine was administered to 812 persons out of a total population of 3248. The number of fever cases is shown below:									AN	3, 1																				
	<table><tr><th>Treatment</th><th>Fever</th><th>No Fever</th></tr><tr><td>Quinine</td><td>20</td><td>792</td></tr><tr><td>No Quinine</td><td>220</td><td>2216</td></tr></table>			Treatment	Fever	No Fever	Quinine	20	792			No Quinine	220	2216																	
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Discuss the usefulness of quinine in checking malaria																															
17	A) For the following time series compute trend values by five yearly moving averages.									EV	3, 1																				
	<table><tr><td>Year</td><td>2000</td><td>2001</td><td>2002</td><td>2003</td><td>2004</td><td>2005</td><td>2006</td><td>2007</td><td>2008</td></tr><tr><td>Value</td><td>14.6</td><td>15.9</td><td>17.4</td><td>17.9</td><td>16.5</td><td>16</td><td>17.1</td><td>18.3</td><td>19.6</td></tr></table>											Year	2000	2001	2002	2003	2004	2005	2006	2007	2008	Value	14.6	15.9	17.4	17.9	16.5	16	17.1	18.3	19.6
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OR B) Calculate the coefficient of association between intelligence or father and son from the following data																															

Qn No.	Question	CL	CO																														
	<table><tr><td>Intelligent Father with intelligent son</td><td>248</td></tr><tr><td>Intelligent father with dull son</td><td>81</td></tr><tr><td>Dull fathers with intelligent sons</td><td>92</td></tr><tr><td>Dull fathers with dull sons</td><td>579</td></tr></table>	Intelligent Father with intelligent son	248	Intelligent father with dull son	81	Dull fathers with intelligent sons	92	Dull fathers with dull sons	579																								
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18	A) In an educational system out of 200 students, 150 were boys. They took an examination and it was found that 120 passed 10 girls failed, is there any association between sex and success in the examination OR B) Examine whether Fisher’s index number satisfy factor reversal test for the following data: <table><tr><th>Commodity</th><th colspan="2">2005</th><th colspan="2">2008</th></tr><tr><td></td><th>P</th><th>Q</th><th>P</th><th>Q</th></tr><tr><td>A</td><td>10</td><td>4</td><td>12</td><td>5</td></tr><tr><td>B</td><td>8</td><td>3</td><td>10</td><td>4</td></tr><tr><td>C</td><td>5</td><td>8</td><td>5</td><td>7</td></tr><tr><td>D</td><td>12</td><td>2</td><td>12</td><td>3</td></tr></table>	Commodity	2005		2008			P	Q	P	Q	A	10	4	12	5	B	8	3	10	4	C	5	8	5	7	D	12	2	12	3	EV	1, 2
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C	5	8	5	7																													
D	12	2	12	3																													
19	A) Of the 1500 candidates appeared for competitive examination, 425 were successful. 250 had attended coaching class and of these 150 came out successful. Estimate the utility of coaching classes. OR B) Construct an ideal index number for the data: <table><tr><th rowspan="2">Commodities</th><th colspan="2">2005</th><th colspan="2">2008</th></tr><tr><th>p</th><th>q</th><th>p</th><th>q</th></tr><tr><td>A</td><td>4</td><td>1</td><td>10</td><td>2</td></tr><tr><td>B</td><td>1</td><td>10</td><td>4</td><td>25</td></tr><tr><td>C</td><td>20</td><td>2</td><td>90</td><td>3</td></tr><tr><td>D</td><td>10</td><td>5</td><td>15</td><td>20</td></tr></table>	Commodities	2005		2008		p	q	p	q	A	4	1	10	2	B	1	10	4	25	C	20	2	90	3	D	10	5	15	20	CR	1, 2	
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