23DAU421N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2025
(Fourth Semester)

Branch - **COMPUTER SCIENCE WITH DATA ANALYTICS**

APPLIED STATISTICS

Time: Three Hours

Maximum: 75 Marks

SECTION-A (10 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** marks (10 × 1 = 10)

Module No.	Question No.	Question	K Level	CO
1	1	Which of the following is a non-sampling error? i) Response error ii) Substitution error iii) faulty demarcation of sampling units iv) Faulty selection of sample	K1	CO1
	2	Simple random sampling is i) Probability sampling ii) Non probability sampling iii) Mixed sampling iv) Judgement sampling	K1	CO1
2	3	What is minimized in the method of least squares? i) The difference between actual value and estimated value ii) The sum of differences between actual and estimated values iii) The sum of squares of the differences between actual and estimated values iv) The sum of squares of actual values	K2	CO2
	4	Which of the following is an assumption of the method of least squares? i) The data has a non-decreasing trend. ii) The data has no cyclical variation. iii) The data has no seasonal variation iv) The Data has no trend	K2	CO2
3	5	Which of the following index numbers satisfies Time Reversal Test? i) Laspeyers Index Number ii) Paasche's Index number iii) Fisher's Index number iv) Kelly's Index number	K2	CO2
	6	The Index number in which current year quantities are used as weights is ------- i) Laspeyer' price index number ii) Laspeyer's Quantitiy index number iii) Paasche's Price Index number iv) Paasche's Quantity index number	K2	CO2
4	7	Which of the following is a Control chart for testing the dispersion? i) X-Bar Chart ii) p-Chart iii) c - Chart iv) R - chart	K2	CO2
	8	Which of the following is called Warning limits? i) 3 sigma limits ii) 2 sigma limits iii) Specification limits iv) Tolerance limits	K2	CO2
5	9	Which of the following Excel function is used to find the arithmetic mean of a number of items? i) Mean() ii) Arithmetic mean() iii) Sum() iv) Average()	K4	CO3
	10	STDEVP(x) provides i) Sample standard deviation ii) Population standard deviation iii) Mean squared deviation iv) Root mean squared deviation	K4	CO3

SECTION - B (35 Marks)
Answer **ALL** questions
ALL questions carry **EQUAL** Marks (5 × 7 = 35)

Module No.	Question No.	Question	K Level	CO
1	11.a.	Explain the methods of selecting a simple random sample.	K1	CO1
		(OR)		
	11.b.	Explain proportional allocation and optimum allocation.		

Cont...

<table>
<tr><td rowspan="4">2</td><td>12.a.</td><td colspan="10">Explain the components of time series.</td><td rowspan="4">K2</td><td rowspan="4">CO2</td></tr>
<tr><td colspan="10">(OR)</td></tr>
<tr><td>12.b.</td><td colspan="10">Compute the three yearly moving averages.
<table><tr><td>Year</td><td>1998</td><td>1999</td><td>2000</td><td>2001</td><td>2002</td><td>2003</td><td>2004</td><td>2005</td><td>2006</td></tr><tr><td>Price</td><td>16</td><td>18</td><td>23</td><td>45</td><td>47</td><td>56</td><td>45</td><td>65</td><td>76</td></tr></table></td></tr>
<tr><td rowspan="4">3</td><td rowspan="2">13.a.</td><td colspan="10">Compute Laspeyers and Paasche's quantity index numbers.
<table><tr><td>Item</td><td colspan="2">Base Year</td><td colspan="2">Current year</td></tr><tr><td></td><td>Price</td><td>Quantity</td><td>Price</td><td>Quantity</td></tr><tr><td>P</td><td>5</td><td>80</td><td>8</td><td>100</td></tr><tr><td>Q</td><td>3</td><td>90</td><td>4</td><td>100</td></tr><tr><td>R</td><td>7</td><td>60</td><td>7</td><td>60</td></tr><tr><td>S</td><td>11</td><td>20</td><td>14</td><td>25</td></tr><tr><td>T</td><td>9</td><td>40</td><td>12</td><td>50</td></tr></table></td><td rowspan="3">K2</td><td rowspan="3">CO2</td></tr>
<tr><td colspan="10">(OR)</td></tr>
<tr><td>13.b.</td><td colspan="10">Compute the arithmetic mean of price relatives for the year 2004 using 2001 as the base year.
<table><tr><td>Commodity</td><td>A</td><td>B</td><td>C</td><td>D</td><td>E</td></tr><tr><td>Price (2001)</td><td>120</td><td>250</td><td>100</td><td>50</td><td>60</td></tr><tr><td>Price (2004)</td><td>150</td><td>200</td><td>120</td><td>100</td><td>150</td></tr></table></td></tr>
<tr><td rowspan="3">4</td><td>14.a.</td><td colspan="10">Explain the factors affecting the quality.</td><td rowspan="3">K2</td><td rowspan="3">CO2</td></tr>
<tr><td colspan="10">(OR)</td></tr>
<tr><td>14.b.</td><td colspan="10">Write the differences between Chance causes and Assignable causes.</td></tr>
<tr><td rowspan="3">5</td><td>15.a.</td><td colspan="10">Explain the steps of entering 11 observations of rainfall in a excel sheet and computing the mean using statistical function.</td><td rowspan="3">K4</td><td rowspan="3">CO3</td></tr>
<tr><td colspan="10">(OR)</td></tr>
<tr><td>15.b.</td><td colspan="10">Write the procedure to compute standard deviation of 13 observations in Excel.</td></tr>
</table>

SECTION -C (30 Marks)

Answer **ANY THREE** questions

ALL questions carry **EQUAL** Marks (3 × 10 = 30)

<table>
<tr><th>Module No.</th><th>Question No.</th><th>Question</th><th>K Level</th><th>CO</th></tr>
<tr><td>1</td><td>16</td><td>Explain sampling errors with examples.</td><td>K1</td><td>CO1</td></tr>
<tr><td>2</td><td>17</td><td>Compute the four yearly moving averages and also compute the fluctuations.
<table><tr><td>Year</td><td>2004</td><td>2005</td><td>2006</td><td>2007</td><td>2008</td><td>2009</td><td>2010</td><td>2011</td><td>2012</td><td>2013</td></tr><tr><td>Sales</td><td>464</td><td>515</td><td>518</td><td>467</td><td>502</td><td>540</td><td>557</td><td>571</td><td>586</td><td>612</td></tr></table></td><td>K2</td><td>CO2</td></tr>
<tr><td>3</td><td>18</td><td>Compute Fisher's Price index number. Also prove that Fisher's Index number is an Ideal Index number using the following data.
<table><tr><td>Item</td><td colspan="2">Base Year</td><td colspan="2">Current year</td></tr><tr><td></td><td>Price</td><td>Quantity</td><td>Price</td><td>Quantity</td></tr><tr><td>P</td><td>4.5</td><td>20</td><td>10.5</td><td>22</td></tr><tr><td>Q</td><td>7</td><td>40</td><td>13</td><td>45</td></tr><tr><td>R</td><td>14</td><td>4</td><td>32</td><td>5</td></tr><tr><td>S</td><td>16.5</td><td>3</td><td>28</td><td>2</td></tr><tr><td>T</td><td>5.5</td><td>2</td><td>9</td><td>1.5</td></tr></table></td><td>K2</td><td>CO2</td></tr>
<tr><td>4</td><td>19</td><td>The following data gives the mean weights and the corresponding range in sample of sizes 5 collected from 10 lots. Test whether the process average and variability are in control.
<table><tr><td>LOT</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr><tr><td>Mean</td><td>21.2</td><td>20.8</td><td>20.6</td><td>20.6</td><td>20.6</td><td>21.2</td><td>21</td><td>21</td><td>21.4</td><td>21</td></tr><tr><td>Range</td><td>3</td><td>2</td><td>2</td><td>2</td><td>2</td><td>3</td><td>2</td><td>3</td><td>4</td><td>5</td></tr></table></td><td>K2</td><td>CO2</td></tr>
<tr><td>5</td><td>20</td><td>Write the procedure to compute Mode of 120 observations in Excel.</td><td>K4</td><td>CO3</td></tr>
</table>

Z-Z-Z END