STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI – 86
(For candidates admitted from the academic year 2025 – 2026)

B.C.A DEGREE EXAMINATION, APRIL 2026
SECOND SEMESTER

COURSE : ELECTIVE
PAPER : MATHEMATICAL STATISTICS FOR COMPUTER SCIENCE
SUBJECT CODE: 25MT/ME/MS23
TIME : 3 HOURS MAX. MARKS: 100

Q. No.	**SECTION A** $(\mathbf{2 \times 5 = 10})$ **Answer ANY TWO questions**	CO	KL
1.	Define exhaustive and mutually exclusive events with examples.	1	1
2.	List the assumptions of Chi-square test	1	1
3.	Write any five differences between correlation and regression.	1	1
Q. No.	**SECTION B** $(\mathbf{2 \times 5 = 10})$ **Answer ANY TWO questions**	**CO**	**KL**
4.	If $P(A) = 0.75$, $P(B) = 0.2$ and $P(A \cap B) = 0.42$, can A and B dependent events?	2	2
5.	Find the area to the right of $Z = 0.25$.	2	2
6.	In a Sample of 400 population from a village, 230 are found to be eaters of vegetarian items and the rest non-vegetarian items. Can we assume that both vegetarian and non-vegetarian food are equally popular?	2	2
Q. No.	**SECTION C** $(\mathbf{2 \times 10 = 20})$ **Answer ANY TWO questions**	**CO**	**KL**
7.	A box contains 4 bad and 6 good tubes. Two are drawn out from the box at a time. One of them is tested and found to be good. Find the probability that the other one is good.	3	3
8.	An examination was given to two classes consisting of 40 and 50 students respectively. In the first class the mean mark was 74 with a standard deviation of 8, while in the second class the mean mark was 78 with a standard deviation of 7. Is there a significant difference between the performance of the two classes at a level of significance of 0.05?	3	3
9.	In a certain sample of 2000 families, 1400 families are consumers of tea. Out of 1800 Hindu families, 1236 families consume tea. Use χ^2 test and state whether there is any significant difference between consumption of tea among Hindu and non-Hindu families.	3	3

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<table>
<tr><th>Q. No.</th><th>SECTION D ($2 \times 20 = 40$)
Answer ANY TWO questions</th><th>CO</th><th>KL</th></tr>
<tr><td>10.</td><td>(a) A bolt is manufactured by 3 machines A, B and C. A turns out twice as many items as B and machines B and C produce equal number of items. 2% of bolts produced by A and B are defective and 4% of bolts produced by C are defective. All bolts are put into one stock pile and 1 is chosen from this pile. What is the probability that it is defective?
(b) The scores made by a candidate in a certain test are normally distributed with mean 500 and standard deviation 100. What percent of candidates receive (i) less than 400 and (ii) between 400 and 600.
(10+10)</td><td>4</td><td>4</td></tr>
<tr><td>11.</td><td>(a) A wholesaler in apples claims that only 4% of the apples supplied by him are defective. A random sample of 600 apples contained 36 defective apples. Test the claim of the wholesaler.
(b) A dice is tossed 120 times with the following results:
<table>
<tr><td>No. turned up</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>Total</td></tr>
<tr><td>Frequency</td><td>30</td><td>25</td><td>18</td><td>10</td><td>22</td><td>25</td><td>120</td></tr>
</table>
Test the hypothesis that the dice is unbiased. (10+10)</td><td>4</td><td>4</td></tr>
<tr><td>12.</td><td>Calculate the two regression equations of X on Y and Y on X from the data given below, taking the deviations from actual means of X and Y.
<table>
<tr><td>Price (Rs.)</td><td>10</td><td>12</td><td>13</td><td>12</td><td>16</td><td>15</td></tr>
<tr><td>Amount demanded</td><td>40</td><td>38</td><td>43</td><td>45</td><td>37</td><td>43</td></tr>
</table>
Estimate the likely demand when the price is Rs. 20.</td><td>4</td><td>4</td></tr>
<tr><th>Q. No.</th><th>SECTION E ($2 \times 10 = 20$)
Answer ANY TWO questions</th><th>CO</th><th>KL</th></tr>
<tr><td>13.</td><td>Four coins are tossed simultaneously. What is the probability of getting (i) 2 heads and 2 tails, (ii) atleast two heads and (iii) atleast one head.</td><td>5</td><td>5</td></tr>
<tr><td>14.</td><td>A machine puts out 16 imperfect articles in a sample of 500. After the machine is overhauled, it puts out 3 imperfect articles in a batch of 100. Has the machine improved?</td><td>5</td><td>5</td></tr>
<tr><td>15.</td><td>Find Karl Pearson’s coefficient of correlation from the following data:
<table>
<tr><td>Wages</td><td>100</td><td>101</td><td>102</td><td>102</td><td>100</td><td>99</td><td>97</td><td>98</td><td>96</td><td>95</td></tr>
<tr><td>Cost of living</td><td>98</td><td>99</td><td>99</td><td>97</td><td>95</td><td>92</td><td>95</td><td>94</td><td>90</td><td>91</td></tr>
</table></td><td>5</td><td>5</td></tr>
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