TOTAL PAGES : 3

22CAU103N

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BCA DEGREE EXAMINATION MAY 2025
(First Semester)

Branch – **COMPUTER APPLICATIONS**

STATISTICS & OPERATIONS RESEARCH

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	The diagram which is used to represent the data classified based on one characteristic is a.Pie chart b. multiple bar diagram c. Subdivided bar diagram d. Rectangular diagram	K1	CO1
	2	Which of the following is not affected by the presence of extreme values? a.Median b.Arithmetic mean c. Standard deviation d. Coefficient of variation	K2	CO1
2	3	The one of the regression coefficient is known to be 1.23, the other regression coefficient is a.equal to 0 b. >0 c. <1 d. equal to 1.23	K1	CO2
	4	To compare the performance of the students in two colleges in an aptitude test, based on whether they passed the exam, using samples of sizes 80 from each college, which of the following test is used? a.Large sample test for single mean b.Small sample test for single mean c. Large sample test for single proportion d. Large sample test for two proportions.	K2	CO3
3	5	To test whether the advertisement has been effective in increasing the sales, which of the following tests will be appropriate? a. Z test b. F test c.Paired t- test d.ANOVA	K1	CO3
	6	To test whether the accidents are equally distributed throughout the week, data on 1400 accidents on various days was selected. What are the expected frequencies for each day? a. 100 b.140 c. 200 d. None of the above	K2	CO3
4	7	In the canonical number of a LPP is , the constraints are of-----type a.$\leq$ *type* b.$\geq$ *type* c $\neq$ *type* d.$=$ *type*	K1	CO4
	8	To facilitate the availability of unit submatrix, which of the following variables is added in a LPP? a.Slack variable b. Surplus variable c.Artificial variable d.Canonical variable	K2	CO4
5	9	What is the relationship between the total availability and the total requirement in a balanced transportation problem? a.Total availability greater than total requirement b.Total availability Less than the total requirement c. (a) or (b) d. Both are equal	K1	CO4
	10	The formula for estimating the time is a.$\frac{t_o+t_m+t_p}{6}$ b.$\frac{t_o+4t_m+t_p}{6}$ c.$\frac{t_o+4t_m+3t_p}{6}$ d.$\frac{t_o+4t_m+t_p}{5}$	K2	CO5

Cont...

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.	Represent the data in a pie diagram. Year: 2010 | 2011 | 2012 | 2013 | 2014 Production in Branch A: 1200 | 1000 | 1500 | 1500 | 2000	K4	CO1
		(OR)		
	11.b.	Calculate the average wages using arithmetic mean Wages: 50 | 75 | 100 | 150 | 250 No. of No. Of Labourers: 8 | 14 | 10 | 5 | 3		
2	12.a.	Random samples of 400 men and 600 women were asked whether they would like to have a flyover near their residence. 200 men and 325 women were in favour of the proposal. Test the hypothesis that the proportions of men and women who are in favor of the proposal are identical at 5% level of significance.	K5	CO2
		(OR)		
	12.b.	Compute the Rank correlation coefficient. X: 50 | 60 | 65 | 70 | 75 | 40 | 70 | 80 Y: 80 | 71 | 60 | 75 | 90 | 82 | 70 | 50		
3	13.a.	The demand for a particular spare part in a factory was found to vary from day-to-day. In a sample study the following information was obtained. Test the hypothesis that the demand does not depend on the day of the week. Day: Mon | Tue | Wed | Thu | Fri | Sat Demand: 1124 | 1125 | 1110 | 1120 | 1126 | 1115	K3	CO3
		(OR)		
	13.b.	A mechanic is making engine parts with axle diameters of 0.7 inch. A random sample of 10 parts shows a mean diameter of 0.742 inch with a standard deviation of 0.040 inch. Test whether the specification is met.		
4	14.a.	Explain the canonical form and standard form of a LPP.	K4	CO4
		(OR)		
	14.b.	Solve graphically. Max Z=2X+3Y s.t $X + 2y \leq 200$, $2X + Y \leq 80$		
5	15.a.	Write the rules to draw a network diagram.	K3	CO5
		(OR)		
	15.b.	Obtain the initial basic feasible solution using North West Corner rule. Origin/Destination→: D1 | D2 | D3 | D4 | Supply O1: 6 | 4 | 1 | 5 | 14 O2: 8 | 9 | 2 | 7 | 16 O3: 4 | 3 | 6 | 2 | 5 Demand: 6 | 10 | 15 | 4 | 35		

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>From the following prices of gold in a week in two cities, identify the city in which the prices are stable.
<table>
<tr><td>Day</td><td>Mon</td><td>Tue</td><td>Wed</td><td>Thu</td><td>Fri</td><td>Sat</td></tr>
<tr><td>City A</td><td>498</td><td>500</td><td>505</td><td>504</td><td>502</td><td>509</td></tr>
<tr><td>City B</td><td>500</td><td>505</td><td>502</td><td>498</td><td>496</td><td>505</td></tr>
</table></td><td>K4</td><td>CO1</td></tr>
<tr><td>2</td><td>17</td><td>Find the regression lines.
<table>
<tr><td>X</td><td>10</td><td>12</td><td>13</td><td>12</td><td>16</td><td>15</td></tr>
<tr><td>Y</td><td>40</td><td>38</td><td>43</td><td>45</td><td>37</td><td>43</td></tr>
</table></td><td>K3</td><td>CO3</td></tr>
<tr><td>3</td><td>18</td><td>The following table gives the weights of 8 pigs before and after introducing a particular food variety. Test whether there is any significant difference in weights at 5% level of significance.
<table>
<tr><td>Food A</td><td>49</td><td>53</td><td>51</td><td>52</td><td>47</td><td>50</td><td>52</td><td>53</td></tr>
<tr><td>Food B</td><td>52</td><td>55</td><td>52</td><td>53</td><td>50</td><td>54</td><td>53</td><td>54</td></tr>
</table></td><td>K3</td><td>CO3</td></tr>
<tr><td>4</td><td>19</td><td>Solve using Simplex method.
Max Z= 3X+ 2Y
s.t X+Y≤ 4, $X - Y \leq 2$ and $X, Y \geq 0$</td><td>K4</td><td>CO4</td></tr>
<tr><td>5</td><td>20</td><td>Using the data given below, find the critical path.
<table>
<tr><td>Act</td><td>1-2</td><td>1-6</td><td>2-3</td><td>2-4</td><td>3-5</td><td>4-5</td><td>6-7</td><td>5-8</td><td>7-8</td></tr>
<tr><td>t_o</td><td>1</td><td>2</td><td>2</td><td>2</td><td>7</td><td>5</td><td>5</td><td>3</td><td>8</td></tr>
<tr><td>t_m</td><td>7</td><td>5</td><td>14</td><td>5</td><td>10</td><td>5</td><td>8</td><td>3</td><td>17</td></tr>
<tr><td>t_p</td><td>13</td><td>14</td><td>26</td><td>8</td><td>19</td><td>17</td><td>29</td><td>9</td><td>32</td></tr>
</table></td><td>K3</td><td>CO5</td></tr>
</table>

Z-Z-Z END