

END SEMESTER EXAMINATION, MAY - 2026**B. B. A. Semester - II****Paper Code:551209****Subject Name: Business Statistics****Subject Code: BBA202****Time allotted: 03 Hours****Max. Marks: 100****Note: Read all the instructions carefully.****Q.1. Objectives Type****(Very short/ Short Answer, MCQ, One-liners, Fill in the Blank, True/ False) Attempt all.(10x2=20)**

a.	Two mutually exclusive events can occur together. (True/False)	CO1
b.	What is conditional probability?	CO1
c.	Correlation coefficient of 0 indicates _____.	CO1
d.	The middle value of a dataset is called _____.	CO1
e.	If $r = +1$, correlation is perfect positive. (True/False)	CO1
f.	Define variance.	CO1
g.	Regression equation predicts _____ variable.	CO1
h.	Which distribution is symmetrical? a) Poisson b) Normal c) Binomial d) None	CO1
i.	Define joint probability.	CO1
j.	In normal distribution, mean = median = mode. (True/False)	CO1

Q.2. Short notes / Short Answer Type (Attempt any five out of Seven)**(5x4=20)**

a.	Compare discrete and continuous frequency distributions with examples.	CO4
b.	Describe the relationship between correlation and regression coefficients.	CO4
c.	Explain the method of least squares for fitting a trend line.	CO3
d.	Describe the meaning and uses of index numbers in business.	CO2
e.	Explain the difference between primary and secondary data with examples.	CO1
f.	Discuss the role of data classification and tabulation in statistical analysis.	CO2
g.	Explain quartile deviation and its importance in measuring dispersion.	CO3

Q.3. Structured Question (Attempt any three out of four)**(3x10=30)**

Q3. Structured Question (Attempt any three out of four)									(Marks: 12)		
a.	(i) A marketing firm employs 60 employees, consisting of 35 males and 25 females. Among them, 6 males and 7 females have been promoted to the position of team leader. If one employee is selected at random, find the probability that the selected employee is either a female or a team leader. (ii) Two investment experts, X and Y, are assigned a challenging financial case. The probability that X solves it correctly is 0.6, and the probability that Y solves it correctly is 0.4. Find the probability that both experts will solve the problem correctly.								CO3		
b.	The following data shows the annual sales (in ₹ crores) of a company for the period 2019 to 2026:								CO3		
Year		2019	2020	2021	2022	2023	2024	2025	2026		
Sales		172	198	215	205	228	240	268	259		
i) Fit a trend line using the method of least squares , taking the origin at the midpoint of the time series . Determine whether the trend shows an increasing or decreasing pattern .											
ii) Estimate the forecasted sales for the year 2028 , assuming the trend continues.											

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c. The following table presents the monthly salaries (in ₹'000) of employees in an organization:	CO4												
<table> <tr> <th>Salary (₹'000)</th><th>15–25</th><th>25–35</th><th>35–45</th><th>45–55</th><th>55–65</th></tr> <tr> <td>Number of Employees</td><td>6</td><td>11</td><td>13</td><td>9</td><td>5</td></tr> </table>	Salary (₹'000)	15–25	25–35	35–45	45–55	55–65	Number of Employees	6	11	13	9	5	
Salary (₹'000)	15–25	25–35	35–45	45–55	55–65								
Number of Employees	6	11	13	9	5								
You are required to: 1. Calculate the mean salary using the assumed mean method. 2. Compute the standard deviation of the salary distribution.													

d. In a manufacturing sector, 140 firms reported their annual profits (in ₹ crores), summarized as follows:	CO4																
<table> <tr> <th>Profits (₹ crores)</th><th>0–15</th><th>15–30</th><th>30–45</th><th>45–60</th><th>60–75</th><th>75–90</th><th>90–105</th></tr> <tr> <td>No. of Firms</td><td>8</td><td>18</td><td>26</td><td>38</td><td>24</td><td>20</td><td>6</td></tr> </table>	Profits (₹ crores)	0–15	15–30	30–45	45–60	60–75	75–90	90–105	No. of Firms	8	18	26	38	24	20	6	
Profits (₹ crores)	0–15	15–30	30–45	45–60	60–75	75–90	90–105										
No. of Firms	8	18	26	38	24	20	6										
You are required to: 1. Calculate the average (mean) profit of the industry. 2. Compute the fourth decile (D₄). 3. Determine the median profit of the industry.																	

Q.4. Long Answer / Essay type (Attempt any two out of three)

(2x15=30)

a.	A factory supervisor wants to examine the relationship between extra working hours of employees and the level of production output. The following data presents the overtime hours worked during different months and the corresponding production levels (in lakhs of units): <table> <tr> <th>Month</th><th>Jan</th><th>Feb</th><th>Mar</th><th>Apr</th><th>May</th><th>Jun</th><th>Jul</th><th>Aug</th><th>Sep</th><th>Oct</th></tr> <tr> <td>Overtime Hours (X)</td><td>38</td><td>42</td><td>47</td><td>52</td><td>58</td><td>62</td><td>57</td><td>45</td><td>43</td><td>40</td></tr> <tr> <td>Production (lakhs units) (Y)</td><td>32</td><td>38</td><td>44</td><td>48</td><td>72</td><td>68</td><td>69</td><td>42</td><td>35</td><td>33</td></tr> </table> You are required to: Calculate Karl Pearson's coefficient of correlation between overtime hours and production output. Also, interpret the nature and strength of the relationship between the two variables.	Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Overtime Hours (X)	38	42	47	52	58	62	57	45	43	40	Production (lakhs units) (Y)	32	38	44	48	72	68	69	42	35	33	CO4
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct																									
Overtime Hours (X)	38	42	47	52	58	62	57	45	43	40																									
Production (lakhs units) (Y)	32	38	44	48	72	68	69	42	35	33																									
b.	The following table shows the distribution of monthly wages (in ₹'000) paid to workers in a manufacturing unit: <table> <tr> <th>Wages (₹'000)</th><th>25–35</th><th>35–45</th><th>45–55</th><th>55–65</th><th>65–75</th><th>75–85</th><th>85–95</th></tr> <tr> <td>Number of Workers</td><td>6</td><td>14</td><td>20</td><td>28</td><td>18</td><td>10</td><td>4</td></tr> </table> You are required to: Calculate the Mean Deviation: (a) About the Mean (b) About the Median	Wages (₹'000)	25–35	35–45	45–55	55–65	65–75	75–85	85–95	Number of Workers	6	14	20	28	18	10	4	CO3, CO4																	
Wages (₹'000)	25–35	35–45	45–55	55–65	65–75	75–85	85–95																												
Number of Workers	6	14	20	28	18	10	4																												
c.	The following data represents the prices of two financial instruments, Security A and Security B, observed over a period of time: <table> <tr> <th>Price of Security A (X)</th><th>22</th><th>27</th><th>33</th><th>30</th><th>29</th><th>35</th><th>28</th><th>37</th><th>32</th><th>31</th></tr> <tr> <td>Price of Security B (Y)</td><td>40</td><td>44</td><td>47</td><td>39</td><td>34</td><td>30</td><td>29</td><td>28</td><td>31</td><td>36</td></tr> </table> You are required to: (a) Determine the two regression equations (Y on X and X on Y). (b) Calculate the coefficient of correlation between the prices of the two securities. (c) Estimate the most probable price of Security B when the price of Security A is 34.	Price of Security A (X)	22	27	33	30	29	35	28	37	32	31	Price of Security B (Y)	40	44	47	39	34	30	29	28	31	36	CO5											
Price of Security A (X)	22	27	33	30	29	35	28	37	32	31																									
Price of Security B (Y)	40	44	47	39	34	30	29	28	31	36																									
