JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2026

PhD-I Semester (JBSW/CSE)

COURSE CODE (CREDITS): 21P1WHS132 (3) MAX. MARKS: 15

COURSE NAME: ECONOMETRICS

COURSE INSTRUCTOR: ASA MAX. TIME: 1 Hour

Note: *(a) All questions are compulsory.*
(b) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems
(c) Use of calculator is ALLOWED.

<table>
<tr><th>Q.No</th><th>Question</th><th>CO</th><th>Marks</th></tr>
<tr><td>Q1</td><td>A junior analyst estimates the following regression of Employee Training Hours per Month (X) on Monthly Productivity Score (Y) for 10 employees in a firm, and reports the following regression output:
$\hat{Y}_i = 42.5 + 3.8\,X_i$; $R^2 = 0.64$, p-value = 0.013, n=10, df = 8.
The analyst concludes that since $\widehat{\beta_2} = 3.8$, which is a large positive number, training clearly and strongly boosts productivity, and the firm should immediately triple its training budget.
Commet on the analyst's report.</td><td>3</td><td>4</td></tr>
<tr><td>Q2</td><td>A researcher wants to study the relationship between Monthly Advertising Expenditure (₹ thousand) and Monthly Sales Revenue (₹ lakh) of a retail firm. She collects the following data for 8 months:
<table>
<tr><td>Month</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></tr>
<tr><td>Advt</td><td>10</td><td>12</td><td>15</td><td>9</td><td>18</td><td>20</td><td>14</td><td>16</td></tr>
<tr><td>Sales</td><td>45</td><td>48</td><td>55</td><td>42</td><td>60</td><td>65</td><td>50</td><td>58</td></tr>
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The researcher specifies the following stochastic model: $Y_i=\beta_1+\beta_2X_i+u_i$
a) Explain what the Population Regression Function would represent in this context, and why the disturbance term (u_i) is a theoretical necessity even though it cannot be directly observed.
b) Distinguish between the Population Regression Function and the Sample Regression Function using this dataset as the sample.
c) If a colleague reports that the Coefficient of for this model is 0.91, interpret this value in plain managerial language for the firm's marketing head.</td><td>2</td><td>6</td></tr>
<tr><td>Q3</td><td>"Regression Analysis exhibits a statistical relationship and not the deterministic relationship". Comment.</td><td>1</td><td>3</td></tr>
<tr><td>Q4</td><td>Briefly explain at least one major limitations of assumptions of OLS model.</td><td>1</td><td>2</td></tr>
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JUIT TEST-1 EXAM-1 TOOK PLACE-2026

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