

Daffodil International University
Department of Business Administration
Course Title: Applied Statistics
Course Code: STA-202

Semester: Summer 2025
Time: 2 Hours
Section: Retake

Examination: Final
Full Marks: 40
Teachers' Initial: ARE

[NB: Answer all the following questions]

Marks

01	a)	Explain the conditions that must be satisfied to apply the Poisson probability distribution.	2
	b)	A commuter airline receives an average of 9.7 complaints per day from its passengers. Using the Poisson formula, find the probability that on a certain day this airline will receive at most 4 complaints also find Mean and Standard Deviation.	6
02	a)	Briefly explain the main characteristics of a normal distribution. Illustrate with the help of graphs.	2
	b)	Find the following probabilities for the standard normal curve with Figures. i) $P(1.19 < z < 2.12)$ ii) $P(-1.56 < z < 2.31)$ iii) $P(-.75 < z)$	6
03	a)	Explain the meaning of a point estimate and an interval estimate	2
	b)	In a 2009 survey by I-Pension LLC, adults with annual household incomes of \$50,000 to \$125,000 were asked about the average time they spend reviewing their 401(k) statements. Of the adults surveyed, about 72% said that they spend less than 5 minutes, and 27% said that they spend 5 to 10 minutes to review their 401(k) statements (USA TODAY, February 16, 2009). Suppose a random sample of 400 adults of all income levels who have 401(k) accounts were recently asked about the times they spend reviewing their 401(k) statements. The sample produced a mean of 8 minutes. Assume that the standard deviation of such times for all 401(k) account holders is 2.20 minutes. Construct a 99% confidence interval for the mean time spent by all 401(k) account holders reviewing their 401(k) statements.	4
04	a)	Briefly explain the meaning of the degrees of freedom for a t distribution. Give one example.	2
	b)	Dr. Moore wanted to estimate the mean cholesterol level for all adult men living in Hartford. He took a sample of 25 adult men from Hartford and found that the mean cholesterol level for this sample is 186 mg/dL with a standard deviation of 12 mg/dL. Assume that the cholesterol levels for all adult men in Hartford are (approximately) normally distributed. Construct a 95% confidence interval for the population Mean.	4
05	a)	Write down the steps of a test of hypothesis using the critical value approach.	2
	b)	The TIV Telephone Company provides long-distance telephone service in an area. According to the company's records, the average length of all long-distance calls placed through this company in 2009 was 12.44 minutes. The	4

		company's management wanted to check if the mean length of the current long-distance calls is different from 12.44 minutes. A sample of 150 such calls placed through this company produced a mean length of 13.71 minutes. The standard deviations of all such call is 2.65 minutes. Using the 2% significance level, can you conclude that the mean length of all current long-distance calls is different from 12.44 minutes?																			
06		Fifteen fourth-grade students were randomly assigned to three groups to experiment with three different methods of teaching arithmetic. At the end of the semester, the same test was given to all 15 students. The table gives the scores of students in the three groups. Calculate the value of the test statistic F. <table><tr><th>Method I</th><th>Method II</th><th>Method III</th></tr><tr><td>48</td><td>55</td><td>84</td></tr><tr><td>73</td><td>85</td><td>68</td></tr><tr><td>51</td><td>70</td><td>95</td></tr><tr><td>65</td><td>69</td><td>74</td></tr><tr><td>87</td><td>90</td><td>67</td></tr></table>	Method I	Method II	Method III	48	55	84	73	85	68	51	70	95	65	69	74	87	90	67	6
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