UNIVERSITY OF THE PUNJAB

B.S. 4 Years Program / Eighth Semester – Spring 2022

Roll No. .....

Paper: Statistics (Advanced) **Course Code: BBA-410** **Time: 3 Hrs. Marks: 60**

THE ANSWERS MUST BE ATTEMPTED ON THE ANSWER SHEET PROVIDED

Q.1. Answer the following short questions. (10x3=30)

i. Confidence Interval
ii. Bootstrapping
iii. Type-I Error
iv. Null and Alternative Hypothesis
v. P-Value
vi. Analysis of Variance
vii. Properties of Least Square Regression Line
viii. Properties of Correlation Coefficient
ix. Multicollinearity
x. Contingency Table

Answer the following Questions. (5x6=30)

Q2. The International Air Transport Association surveys business travelers to develop quality ratings for transatlantic gateway airports. The maximum possible rating is 10. Suppose a simple random sample of 32 business travelers is selected and each traveler is asked to provide a rating for the Miami International Airport. The ratings obtained from the sample of 50 business travelers follow:

6	4	6	8	7	7	6	3	3	8	10	4	8	7	8	7
5	9	5	8	4	3	8	5	5	4	4	4	5	6	2	5

i) Develop a 95% confidence interval estimate of the population mean rating for Miami.
ii) Test the hypothesis that the mean rating for Miami differs from 5.

Q3. According to the federal government, 24% of workers covered by their company's health care plan were not required to contribute to the premium (*Statistical Abstract of the United States: 2006*). A recent study found that 81 out of 400 workers sampled were not required to contribute to their company's health care plan. Test the hypotheses by using 95% confidence interval that the percent of workers not required to contribute to their company's health care plan differs from the federal government claim.

Q4. To avoid extra checked-bag fees, airline travelers often pack as much as they can into their suitcase. Finding a rolling suitcase that is durable, has good capacity, and is easy to pull can be difficult. The following table shows the results of tests conducted by Consumer Reports for 10 rolling suitcases; higher scores indicate better overall test results (Consumer Reports website, October 2008).

Price ($)	325	350	67	120	85	180	360	156	595	400
Score	72	74	54	54	64	57	66	67	87	77

i. Develop a scatter diagram for these data with price as the independent variable.

ii. Predict the score for The Eagle Creek Hovercraft suitcase with price $225 using the estimated least square regression equation.

iii. Find the Pearson's correlation coefficient between the price and the score.

Q5. Four hundred and ninety two candidates for scientific posts gave particulars of their University degrees and their hobbies. The degrees were in Maths, Economics or Commerce, and the hobbies could be classified roughly as music, crafts work, reading or drama. The data is presented in the following contingency table:

Categories	**Maths.**	**Economics**	**Commerce**
Music	24	83	17
Crafts work	11	62	28
Reading	32	121	34
Drama	10	26	44

Is there any association between the degrees and hobbies? Also compute the coefficient of contingency.

Q6. Three sections of the same statistics course are taught by three teachers. The final grades given by the three teachers (independently) were recorded as follows:

Teacher A	75	91	84	45	82
Teacher B	59	83	99	77	65
Teacher C	66	77	51	90	73

Test the hypothesis that the average grades given by the three teachers are same by using the ANOVA table.