Instruction:

(A) Questions in this paper should be answered by students whose **surnames** fall within the range **N-Z**.

(B) Use the Excel files '**Dataset9** and **Dataset10'** to answer questions asked in **Part A** and '**Dataset11**'and '**Dataset12**' to answer questions asked in **Part B**.

(**C**) A **heavy penalty** will be applied if your answers are not based on datasets assigned to you.

Part A: **Note**: for questions in Part A assume that the three assumptions underlying ANOVA (i.e., randomness and independence, normality, and homogeneity of variance) are met. Use the **closest** degrees of freedom for the denominator to get critica

(1) Using **Datase** of significance if there is any evidence of a significant difference in ight (**bweight**) in grams for children in three groups defined by the l background (**medu**). Follow all the necessary steps to perform the te ults using Excel/PHStat. **Note**: in your data, the variable "**medu**" is coded **1** for mothers who completed primary education, **2** for mothers who completed secondary education and **3** for mothers who completed tertiary education.

(2) If your results in (1) indicate that it is appropriate, use the Tukey-Kramer procedure to determine which groups of **medu** differ in average birth weight (**bweight**). Use a 5% level of significance. Follow all the necessary steps to perform the test and verify your results using Excel/PHStat.

(3) Using **Dataset10** test at a 5% level of significance if there is any evidence of a significant difference in the average weekly wages (**wgs**) for employees in four groups defined by their occupation (**occ**). Follow all the necessary steps to perform the test and verify your results using Excel/PHStat. **Note**: in your data, the variable "**occ**" is coded **1** for professionals, **2** for labourers, **3** for managers, and **4** for machinery operators.

(4) If your results in (3) indicate that it is appropriate, use the Tukey-Kramer procedure to determine which groups of **occ** differ in average weekly wages (**wgs**). Use a 5% level of significance. Follow all the necessary steps to perform the test and verify your results using Excel/PHStat.

Part B **Note**: for questions in Part B assume that the **three** assumptions underlying ANOVA (i.e, randomness and independence, normality, and homogeneity of variance) are met. Use the **closest** degrees of freedom for the denominator to get critical value from F-table.

1. A company p[illegible]ed beverage and food products has developed four new drink flavour[illegible] conduct a taste test to collect data on customers' preferences. F[illegible]l to rate each flavour on a scale 1-50. The data are saved in '**Dataset11**[illegible]**person** is the blocking variable. Drink flavour is coded **1** if fruit punc[illegible]fierce grape, and **4** if lemon-lime.

   Based on the information given, answer the following questions.

   (a) At the 5% level of significance, was blocking effective? Follow all the necessary steps and verify your results using Excel/PHStat.
   (b) Using a 5% level of significance, is there a significance difference in the mean rating (**rating**) of the four flavours? Follow all the necessary steps to perform the test.

   (c) If your results in (b) indicate that it is appropriate, use the Tukey procedure to determine which groups of **flavour** differ in the mean rating. Use a 5% level of significance. Follow all the necessary procedure to perform the test.

2. Inspire Training and Education Department (ITED) conducts project management training courses throughout Brisbane. The department has developed three 150-point practice examinations meant to simulate the certification exams given by the Project Management Institute (PMI). ITED wants to know if the three exams will yield the same or different mean scores. To test this a random sample of 9 people who have been through the project management training are asked to take the three tests. The order the tests are taken is randomised and the scores are recorded and saved in '**Dataset12**'. **Hint**: the variable **student** is the blocking variable.

   Based on the information given, answer the following questions.

   (a) At the 5% level of significance, was blocking effective? Follow all the necessary steps and verify your results using Excel/PHStat.
   (b) Using a 5% level of significance, is there a significance difference in the mean exam score of the three exam types? Follow all the necessary steps to perform the test.
   (c) If your results in (b) indicate that it is appropriate, use the Tukey procedure to determine which groups differ in the mean exam score. Use a 5% level of significance. Follow all the necessary procedure to perform the test.