

C11BA Resit Assignment 2020/21

Complete ALL questions. 100 marks in total.

Question 1 (20 marks)

The owner of a driving school has been monitoring the number of hours of lessons that pupils require before they pass the practical driving test. Last year the average was 17.2 hrs. A new practical test was introduced in 2017 and the owner believes that pupils require significantly more hours of lessons if they are to pass. So far, he has a sample of 35 pupils who have taken the new test and passed. The average number of hours of lessons required was 19.6 hrs with a standard deviation of 4.2 hrs.

- a) Use an appropriate level of significance to test if his assertion is valid or not;
- b) Explain what is meant by 'level of significance'

Question 2 (30 marks)

Compare and contrast different forms of Simulation Modelling used in a business context. Ensure that you explain the different types, their benefits and any limitations. Include examples of the application of simulation to support your arguments. You should visit the websites of simulation software providers where you will find relevant examples to choose from. (max. 800 words)

Question 3 (30 marks)

Your company sells carbonated soft drinks to grocery retailers across the region. To help with the future forecasting and planning of one particular product ('Zingy Orange' sold in units of 24 two litre bottles) you decide to explore the impact of different factors on product sales.

You will find the following monthly data covering a 3 year period in the accompanying Excel file:

- Sales revenue from January 2018 to December 2020 in £ 000s
 - Product Selling price per unit (one unit = 24 two litre bottles) in £s
 - Advertising spend in £ 000s
 - Competitor activity Y/N (Yes or No) in each month
- a) Using the relevant tools in the Excel Analysis Toolpak determine how significant the independent factors are in determining product unit sales.
 - b) Produce a forecast of sales for 2021 (using a suitable regression model) and clearly state your assumptions.

Question 4 (20 marks)

Engineers at **HW Technology Ltd.** have designed a 'cutting edge' new product and must decide between two highly complex production methods. If production method 1 is chosen, there is a 60% chance that the method will be successful, in which case the return will be €6 million. If the method fails, HW Technology will have to decide whether or not to modify it, or whether to abandon the entire project at a loss of €5 million. If the method is modified, there is a 0.4 probability that it will work and yield net returns of €1 million. However, if the modification also fails, losses of €6 million will be incurred.

If production method 2 is chosen, there is a 70% chance that it will work and yield returns of €3 million. However, if it fails, losses of €2 million will be incurred; for technical reasons, this production method cannot be modified.

- a) Construct a decision tree to illustrate this decision problem. *You may prefer to produce this by hand, and insert/paste a photograph or scan of your complete and annotated tree into your word file for submission.*
- b) Determine the sequence of decisions, which maximises expected returns (EMV). Show ALL calculations and annotate your decision tree appropriately.
- c) Comment on the limitations of using this decision criterion and the decision tree method.

Submission deadline: 4pm on Monday 9th August 2021

HAND-IN: Upload your completed answers as word doc file or pdf file to Turnitin before 4pm on Monday 9th August 2021. Also send your completed Excel file solution to Q3 directly to c.rutherford@hw.ac.uk

End of Resit Assignment