**Question 32: [from 2015 Sem I paper] (12 marks)**

A scientist was investigating the effectiveness of a newly developed drug, “Neurogen”, and its ability to improve recovery from nerve cell injury. The experiment was performed as described below:

Nerve cells were placed into culture medium (a solution containing nutrients to keep the cells alive and help them grow). An equal number of nerve cells (in culture medium) were transferred into nine test tubes and maintained under constant temperature and oxygen levels. Three of the test tubes received no further treatment. Of the remaining six test tubes, three tubes received a large, single dose of Neurogen whilst the remaining three tubes had a series of smaller doses of Neurogen added over a one week period.

After one month the growth of nerve axons in the test tubes was measured and the results are shown in the table below.

|  |  |  |
| --- | --- | --- |
| **TREATMENT** | Tube number | **GROWTH OF NERVE AXONS  AFTER ONE MONTH (mm)** |
| NEUROGEN (Large, single dose) | 1  2  3 | 0.50  0.42  0.45 |
| NEUROGEN (Series of small doses) | 4  5  6 | 0.80  0.98  0.90 |
| NO TREATMENT | 7  8  9 | 0.25  0.27  0.19 |

For the experiment described:

(a) Identify **ONE** hypothesis being tested. (2 marks)

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(b) What is the Dependent Variable? (1 mark)

1. Based on the information given, list **three** variables that were controlled in this

experiment. (3 marks)

1. What is the purpose of having the three test tubes that did not receive any treatment with Neurogen? (2 marks)

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(e) What **two** major conclusions could be drawn from these results? (2 marks)

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(f) After this experiment, the scientist repeated the procedure three more times. Why would the scientist repeat the experiment so many times? (2 Marks)

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