# 1. Appendix 3

(1) 

| **Exam \* Answer Crosstabulation** | | | | |
| --- | --- | --- | --- | --- |
| Count | | | | |
|  | | Answer | | Total |
| right | wrong |
| Exam | Exam3\_Q33 (2010) | 65 | 24 | 89 |
| Exam3\_Q22 (2010) | 40 | 49 | 89 |
| Total | | 105 | 73 | 178 |

| **Chi-Square Tests** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 14.514a | 1 | .000 |  |  |
| Continuity Correctionb | 13.376 | 1 | .000 |  |  |
| Likelihood Ratio | 14.747 | 1 | .000 |  |  |
| Fisher's Exact Test |  |  |  | .000 | .000 |
| Linear-by-Linear Association | 14.432 | 1 | .000 |  |  |
| N of Valid Cases | 178 |  |  |  |  |
| a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 36.50.  b. Computed only for a 2x2 table | | | | | |

Because of P=0.000<0.05, there is significant difference

(2) 

| **Exam \* Answer Crosstabulation** | | | | |
| --- | --- | --- | --- | --- |
| Count | | | | |
|  | | Answer | | Total |
| right | wrong |
| Exam | Exam3\_Q33 (2011) | 60 | 15 | 75 |
| Exam3\_Q22 (2011) | 38 | 37 | 75 |
| Total | | 98 | 52 | 150 |

| **Chi-Square Tests** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 14.246a | 1 | .000 |  |  |
| Continuity Correctionb | 12.981 | 1 | .000 |  |  |
| Likelihood Ratio | 14.589 | 1 | .000 |  |  |
| Fisher's Exact Test |  |  |  | .000 | .000 |
| Linear-by-Linear Association | 14.151 | 1 | .000 |  |  |
| N of Valid Cases | 150 |  |  |  |  |
| a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 26.00.  b. Computed only for a 2x2 table | | | | | |

Because of P=0.000<0.05, there is significant difference

(3) 

| **Exam \* Answer Crosstabulation** | | | | |
| --- | --- | --- | --- | --- |
| Count | | | | |
|  | | Answer | | Total |
| right | wrong |
| Exam | Exam3\_Q33 (2012) | 67 | 13 | 80 |
| Exam3\_Q22 (2012) | 34 | 46 | 80 |
| Total | | 101 | 59 | 160 |

| **Chi-Square Tests** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 29.240a | 1 | .000 |  |  |
| Continuity Correctionb | 27.495 | 1 | .000 |  |  |
| Likelihood Ratio | 30.548 | 1 | .000 |  |  |
| Fisher's Exact Test |  |  |  | .000 | .000 |
| Linear-by-Linear Association | 29.057 | 1 | .000 |  |  |
| N of Valid Cases | 160 |  |  |  |  |
| a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 29.50.  b. Computed only for a 2x2 table | | | | | |

Because of P=0.000<0.05, there is significant difference

# 2

(1) 

| **Exam \* Answer Crosstabulation** | | | | |
| --- | --- | --- | --- | --- |
| Count | | | | |
|  | | Answer | | Total |
| right | wrong |
| Exam | Exam3\_Q33 (2010~2011) | 192 | 52 | 244 |
| Exam3\_Q22 (2010~2011) | 112 | 132 | 244 |
| Total | | 304 | 184 | 488 |

| **Chi-Square Tests** | | | | | |
| --- | --- | --- | --- | --- | --- |
|  | Value | df | Asymp. Sig. (2-sided) | Exact Sig. (2-sided) | Exact Sig. (1-sided) |
| Pearson Chi-Square | 55.835a | 1 | .000 |  |  |
| Continuity Correctionb | 54.448 | 1 | .000 |  |  |
| Likelihood Ratio | 57.273 | 1 | .000 |  |  |
| Fisher's Exact Test |  |  |  | .000 | .000 |
| Linear-by-Linear Association | 55.721 | 1 | .000 |  |  |
| N of Valid Cases | 488 |  |  |  |  |
| a. 0 cells (.0%) have expected count less than 5. The minimum expected count is 92.00.  b. Computed only for a 2x2 table | | | | | |

Because of P=0.000<0.05, there is significant difference