**Question 1**

A company wants to produce three different mobile phones, with low-range, mid-range and high-range specifications, respectively. A survey with 100 respondents has been used to reveal the choices of potential customers. The company wants to review the figures to see if the three mobile phones would be equally popular. The results of the Chi-Square test are given in the following tables:

|  |  |  |  |
| --- | --- | --- | --- |
| **MOBILE** | | | |
|  | Observed N | Expected N | Residual |
| 1.00 | 31 | 33.3 | -2.3 |
| 2.00 | 45 | 33.3 | 11.7 |
| 3.00 | 24 | 33.3 | -9.3 |
| Total | 100 |  |  |

|  |  |
| --- | --- |
| **Test Statistics** | |
|  | MOBILE |
| Chi-Square | 6.860a |
| df | 2 |
| Asymp. Sig. | .032 |
| a. 0 cells (0.0%) have expected frequencies less than 5. The minimum expected cell frequency is 33.3. | |

Use the information provided in the tables to:  
(a) Describe the null hypothesis for the Chi-Square test.

* 1. (b)  Discuss the results and explain whether there are statistically significant differences in the

preference for the three devices.

* 1. (c)  What are the underlying assumptions of the Chi-Square test? Explain if, in your opinion,

those are met in the above examples.

**Question 2**

An institute conducted a survey where a sample of 50 people were asked whether or not have been promoted to a better job in their industry during the last 24 months. For each respondent, the variables AGE, EXPERIENCE (years of employment in the industry) and SEX (i.e. male (1) or female (0)) are recorded. A logistic regression was then used to estimate the probability of a promotion within 24 months as a function of the variables. The estimation results are shown below:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Variables in the Equation** | | | | | | | |
|  | | B | S.E. | Wald | df | Sig. | Exp(B) |
| Step 1a | AGE | .035 | .036 | .940 | 1 | .332 | 1.035 |
| EXPERIENCE | .148 | .107 | 1.908 | 1 | .167 | 1.159 |
| SEX | -.986 | .672 | 2.154 | 1 | .142 | .373 |
| Constant | -1.866 | 1.196 | 2.436 | 1 | .119 | .155 |
| a. Variable(s) entered on step 1: AGE, EXPERIENCE, SEX. | | | | | | | |

* 1. (a)  Use the information in the table to discuss the sign, magnitude and statistical significance of the coefficients.
  2. (b)  Would you consider the model as a good tool for predicting promotions? Why?