2(a)	$p = \dfrac{e^{-2.8}(2.8)^3}{3!} \times 100 = 22.248$
	$q = \dfrac{(29 - 22.25)^2}{22.25} = 2.05$
2(b)	H_0: Po(2.8) fits the data. H_1: Po(2.8) does not fit the data. OR H_0: Po(2.8) is a satisfactory model for the number of cars (entering the car park). H_1: Po(2.8) is not a satisfactory model for the number of cars (entering the car park).
	$2.739 + 0.241 + 2.152 + '2.049' + 0.425 + 3.753 + 0.037 \quad [= 11.396]$
	$'11.4' < 12.59$, accept H_0 / do not reject H_0 / not significant.
	Insufficient evidence to suggest that Po(2.8) is not a good fit to the data. OR Insufficient evidence to suggest that the manager's claim is false.

3(a)	$m = 69.522$
	$n = 0.156$ or 0.157
3(b)	H_0: $\text{Po}(0.7)$ fits the data. H_1: $\text{Po}(0.7)$ does not fit the data.
	Combining last 3 columns give 13 and 6.828 or 6.829.
	$\frac{(88-99.317)^2}{99.317} + \frac{(73-69.552)^2}{69.552} + \ldots + \frac{(13-6.829)^2}{6.829}$ $[1.2896 + 0.1740 + 0.1142 + 5.5764]$ OR $\frac{88^2}{99.317} + \frac{73^2}{69.552} + \frac{26^2}{24.333} + \frac{13^2}{6.829} - 200$
	7.15 or 7.16
	$'7.15' < 7.815$, accept H_0 / do not reject H_0 / not significant.
	Insufficient evidence to reject expert's claim. OR Insufficient evidence to suggest that $\text{Po}(0.7)$ is not a good fit/model [for the data].

<table>
<tr><td>5</td><td>H_0: performance is independent of age.
H_1: performance is not independent of age.
OR
H_0: passing test is independent of age.
H_1: passing test is not independent of age.</td></tr>
<tr><td></td><td><table><tr><td>34 (27.93)</td><td>41 (44.69)</td><td>6 (8.38)</td></tr><tr><td>16 (22.07)</td><td>39 (35.31)</td><td>9 (6.62)</td></tr></table></td></tr>
<tr><td></td><td>$\frac{(34-27.93)^2}{27.93}+\frac{(41-44.69)^2}{44.69}+\ldots+\frac{(9-6.62)^2}{6.62}$
$[1.319+0.305+0.676+1.669+0.386+0.856]$
OR
$\left(\frac{34^2}{27.93}+\frac{41^2}{44.69}+\ldots+\frac{9^2}{6.62}\right)-145$</td></tr>
<tr><td></td><td>5.21</td></tr>
<tr><td></td><td>$'5.21' > 4.605$, reject H_0 / significant.</td></tr>
<tr><td></td><td>Sufficient evidence to suggest that performance and age are not independent.
OR Sufficient evidence to suggest that performance and age are dependent.
OR Sufficient evidence to suggest that performance and age are associated.
OR Sufficient evidence to support the (driving) instructor's belief.</td></tr>
<tr><td></td><td></td></tr>
</table>

3(a)	$\left[\dfrac{0\times1844+1\times143+2\times11+3\times0+4\times1+5\times0+6\times1}{2000\times6}=\right]\ \dfrac{7}{480}$
3(b)	$a=2000-(1831.3+6.016+0.119+0.001)=162.6$
	Alternative method for question 3(b)
	$a=\binom{6}{1}\times\frac{7}{480}\times\left(1-\frac{7}{480}\right)^5\times2000\ =162.6$
3(c)	H_0 : A binomial distribution is a satisfactory model for the data. H_1 : A binomial distribution is not a satisfactory model for the data.
	$\dfrac{(1844-1831.3)^2}{1831.3}+\dfrac{(143-162.6)^2}{162.6}+\dfrac{(13-6.136)^2}{6.136}\ [=0.08807+2.3626+7.6784]$ OR $\dfrac{1844^2}{1831.3}+\dfrac{143^2}{162.6}+\dfrac{13^2}{6.136}-2000$
	10.1
	[1 degree of freedom so critical value is 7.879.] $'10.1'>7.879$, reject H_0 (significant).
	Sufficient evidence to suggest that the manager’s model is not satisfactory.
3(d)	Not independent or probability of “success” may not be constant or plausible reason in context (for example, higher number of boxes with more than 1 broken egg due to boxes being dropped).

1	H_0: uniform distribution fits the data. H_1: uniform distribution does not fit the data.
	Expected frequencies are 40, 40, 40.
	$\frac{(38-40)^2}{40}+\frac{(52-40)^2}{40}+\frac{(30-40)^2}{40}[=0.1+3.6+2.5]$ OR $\frac{38^2}{40}+\frac{52^2}{40}+\frac{30^2}{40}-120$
	6.2
	[2 degrees of freedom, so critical value is 5.991.] $'6.2'>5.991$, reject H_0 (significant).
	Sufficient evidence to suggest that the scientist's claim is incorrect. OR Sufficient evidence eye colour is not uniformly distributed. OR Sufficient evidence to suggest that uniform distribution is not a good fit.