6.1 More Examination Questions

Question 1

S2 Examination Question from Wednesday 21st January 2009, Q3

A single observation x is to be taken from a Binomial distribution B(20, p)
This observation is used to test $H_0 : p = 0.3$ against $H_1 : p \neq 0.3$

(a) Using a 5 % level of significance, find the critical region for this test. The probability of rejecting either tail should be as close as possible to 2.5 %.

[3 marks]

(b) State the actual significance level of this test.

[2 marks]

The actual value of x obtained is 3

(c) State a conclusion that can be drawn based on this value, giving a reason for your answer.

[2 marks]

Question 2

S2 Examination Question from Friday 14th January 2011, Q2

A student takes a multiple choice test.
The test is made up of 10 questions each with 5 possible answers.
The student gets 4 questions correct.
Her teacher claims the student was guessing the answers.
Using a one tailed test, at the 5 % level of significance, test whether or not there is evidence to reject the teacher's claim.

State your hypotheses clearly.

[6 marks]

Question 3

S2 Examination Question from Tuesday 19th January 2010, Q6

(a) Define the critical region of a test statistic.

[2 marks]

A discrete random variable X has a Binomial distribution B(30, p).
A single observation is used to test $H_0 : p = 0.3$ against $H_1 : p \neq 0.3$

(b) Using a 1 % level of significance find the critical region of this test.
You should state the probability of rejection in each tail which should be as close as possible to 0.005

[5 marks]

(c) Write down the actual significance level of the test.

[1 mark]

The value of the observation was found to be 15.

(d) Comment on this finding in light of your critical region.

[2 marks]

Question 4

S2 Examination Question from Tuesday 16th January 2007, Q6 (a)

Past records from a large supermarket show that 20 % of people who buy chocolate bars buy the family size bar. On one particular day a random sample of 30 people was taken from those that had bought chocolate bars and 2 of them were found to have bought a family size bar.

Test, at the 5 % significance level, whether or not the proportion p of people who bought a family size bar of chocolate that day had decreased.
State your hypotheses clearly.

[6 marks]