Test - Hypothesis testing

Year: Year 12 · Duration: 60 minutes · /20

Name:	Date:	**Mark: /20**

Question	1	2	3	4	5	Total
marks	4	4	4	4	4	**20**
Mark						

Show your working.

Question 1 (4 marks)

Question 1 – One-tailed test

The probability that a train is on time is claimed to be 0.8. In a sample of 15 trains, 9 are on time. Test at the 5% level whether the probability is lower than claimed.

Question 2 (4 marks)

Question 2 – Critical region

$X \sim B(25, 0.3)$. Find the critical region for a one-tailed test of $H_0 : p = 0.3$ against $H_1 : p > 0.3$ at the 5% level, and state the actual significance level.

Question 3 (4 marks)

Question 3 – Two-tailed test

A manufacturer claims 50% of customers prefer flavour A. In a sample of 20, 5 prefer A. Test at the 5% level whether the proportion differs from 50%.

Question 4 (4 marks)

Question 4 – Interpreting significance

A test is carried out at the 5% level and H_0 is rejected.

a. Explain what 5% means in this context. (2 marks)
b. Explain why the result does not prove H_1. (2 marks)

Question 5 (4 marks)

Question 5 – Problem: a vaccine

Without a vaccine, 30% of people catch a virus. 20 vaccinated people are monitored and 2 catch it.

a. State hypotheses and test at the 5% level. (3 marks)
b. State the actual significance level of the test. (1 mark)