

Q1-6 marks and comments

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Q1 Marks: 8 (4+2+2)

(b) Need to justify $b_1 < b_2 < b_3$

(c) “chance to reject a wrong H_0 ” is determined by the probability of Type II error.

Q2 Marks: 9 (1+4+4)

(a) T: $Y_i \sim \text{Bin}(1, p_i)$ with $p_i = \Pr(X_i > 0)$

Q3 Marks: 12

Q4 Marks: 7 (4+1+2)

(b) T: See the solution.

(c) Explanation is not convincing; see the solution.

Q5 Marks: 16

(b) $(Z_{(3)}, Z_{(9)}) = (-44, 91)$

Q6 Marks: 12

Show the steps from integrals to numerical results.

(b) $\Pr(X_1 > 0, R_1 = 2, X_2 < 0) = \Pr(X_1 < 0, R_2 = 2, X_2 > 0) = 31/320$.