STATISTICS APPLIED TO BUSINESS ADMINISTRATION
ACADEMIC YEAR 2021-2022
PRACTICAL EXERCISES 6 AND 7 (30 MINUTES)

Date: _____

Complete name:_____ ID number:_____

EXERCISE 1 (10 POINTS)

Let X be a r.v. with probability density function:

$$f(x, \theta) = \frac{\theta \ x^{\theta-1}}{2^{\theta}}, \quad 0 \le x \le 2, \quad \theta > 0$$

Based on a r.s. of size $n = 1$, X_1, we wish to test the null hypothesis $H_0 : \theta = 1$ against the alternative hypothesis $H_1 : \theta = 2$.

1. **(6 points)** Find the most powerful critical region for this test and for the test statistic X_1. We can assume that $\alpha = 0.10$.

2. **(4 points)** Compute the power for this test.

EXERCISE 2 (10 POINTS)

In a hospital, researchers believe that the weight newborn babies have (in Kilograms) follows a normal $N(m = 3.30, \sigma^2 = 0.5)$ distribution. In order to test this hypothesis, a random sample of $n = 200$ newborn babies was taken, providing the following results:

Weight	Less than 2Kg.	2 to 3 Kg.	3 to 4 Kg.	More than 4 Kg.
Newborn babies	5	60	104	31

Using the information provided by the sample and at the $\alpha = 5\%$ significance level, test the previously specified hypothesis.