## STATISTICS APPLIED TO BUSINESS ADMINISTRATION. ACADEMIC YEAR 2014-2015 PRACTICAL EXERCISE 3 (20 MINUTES)

Date: \_\_\_\_\_

Complete name:\_\_\_\_\_ ID number:\_\_\_\_\_

## EXERCISE 1 (4 POINTS)

Let X be a r.v. with characteristic function given by  $\psi_x(u) = (1 - 5iu)^{-1}$ 

- 1. (2 points) Compute the mean and the variance of the r.v. X.
- 2. (2 points) What is the value of P(-2 < X < 2)?

## EXERCISE 2 (6 POINTS)

Let  $X_1, X_2, X_3, X_4$  and  $X_5$  be five independent r.v. such that:  $X_1 \in N(-2, \sigma^2 = 4)$ ,  $X_2 \in N(0, \sigma^2 = 9), X_3 \in N(5, \sigma^2 = 1), X_4 \in N(1, \sigma^2 = 4)$  and  $X_5 \in N(0, \sigma^2 = 1)$ .

1. (2 points) Let 
$$W = \frac{1}{4} (X_1 + 2)^2 + \frac{1}{9} X_2^2 + (X_3 - 5)^2$$
. Compute  $P(W \ge 6.25)$ .

2. (2 points) Let 
$$V = \frac{\sqrt{2} X_5}{\sqrt{\left(\frac{X_1+2}{2}\right)^2 + \left(\frac{X_2}{3}\right)^2}}$$
. Compute  $P(-0.816 \le V \le 2.92)$ .  
3. (2 points) Let  $Y = \frac{3\left[\left(\frac{X_4-1}{2}\right)^2 + X_5^2\right]}{2 W}$ . Find the value of k such that  $P(Y > k) =$