Dav
Mathen
Final

Winter 2022: Wedi

201-BZS-05 (Sec. 0000

Examiner: S. Shahabi.

Student's Full Name:

- Print your name and student ID numbe
- All questions are to be answered direct
  space for your answer, use the back of t
- No book, notes, graphing/programmabl
  the Sharp EL-531XG calculator during t
- A Formula Sheet and the relevant Stat
- You must show all your work and justify
- This examination booklet, all the Statist

With Solutions

THIS EXAMINAT
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2. [5

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3. [5 pts.] A system composed of
one of the components functio
functions with probability p_i, e

E_i = the event t
$1 \le i \le n$ componen

$P(E_i) = 1 - P_i$

$E_1 \cap E_2 \cap \cdots \cap E_n$

$P(E_1 \cap \cdots \cap E_n)$

P(system function

4. [5 pts.] The average number
Give the probability that the c

- the average # o
- this is a P
- We want P

$= 1 -$

$= 1 -$

5. [8 pts.]
$f(t) = \frac{1}{1}$
least 4 o
longer t

$X =$

We

where

$P = \int_{12}^{+\infty}$

$= \frac{1}{e^{1.2}} \approx 0.$

6. A pair o

(a) [3 p
prob. dis

$P($ sum

$f(n) =$

(b) [5 p

$\sum_n f(n)$

$= \frac{1}{18^2}$

$= \frac{1}{1^2}$

7. [8 pts.] A n
a mean breal
found to hav
sample suppo

$H_0: \mu =$

$\alpha = 0.01$

$Z_0 = \frac{\bar{X} -}{\sigma /}$

Since

-2.575

Conclu

8. [8 pts.] Th

regime:

Can we conc
$\alpha = 0.05$.

$H_0: \mu_B - \mu_$

$t_0 = \frac{\bar{d} -}{s_d /}$

Conc

11. [8 pts.] Th
with mean
probability

$\Downarrow$

$\alpha \leq$

$\Downarrow$

Z_α

12. [8 pts.] A v
machine is o
a Test of Hy

H_0: The

(H_0 :

$t_0 = \frac{\overline{X}_0}{S/}$

$t_{\alpha/2} =$

(d.f. = 24

Conclus

13. [8 pts.] A pair of c
fair? Test with $\alpha =$

H_0: both die
H_a: not as in

$$\chi_0^2 = \frac{(8-10)^2}{10} + ($$

$$+ \frac{(46-50)}{50}$$

$$= 2.28\overline{3}$$

Since $\chi_0^2 < \chi_\alpha^2$

we don't rejec

14. [8 pts.] Using the
Use $\alpha = 0.05$.

H_0: age & party a
H_a: not as in

$$\chi_0^2 = \sum\sum ($$

$$\chi_\alpha^2 = 9.4$$

$((2)(2) = 4)$