

## Exam 4 Answers

1. A
2. B
3. C
4. C
5. D
6. A
7. A
8. C
9. D
10. C
11. D
12. A
13. D
14. B
15. C
16. B
17. D
18. A
19. B
20. B
21. D
22. D
23. A
24. A
25. A

26. As  $\alpha$  increases, critical F becomes smaller. As sample size increases, critical F becomes smaller. In most cases, as the number of conditions (levels in a factorial design) increases, critical F becomes smaller. In order to reject  $H_0$  the size of the critical F should be as small as possible because we reject  $H_0$  when observed  $F \geq$  critical F.

27.

A. No main effect of number of cats.  
No main effect of sex. Interaction of

number of cats and sex.

B. Main effect of length of friendship. Main effect of sex. Cannot determine if an interaction occurs.

C. Main effect of smoking. Main effect of being an athlete. Interaction between smoking and being an athlete.

28. The 2 X 3 between-subjects analysis of variance (ANOVA) failed to reveal a main effect of location,  $F(1, 66) = 3.399, p = .070, Mse = 4944.76, \alpha = .05$ . The ANOVA revealed a main effect of the number of dissenters,  $F(2, 66) = 8.897, p \leq .0005$ . The ANOVA failed to reveal an interaction of location and the number of dissented,  $F(2, 66) = 0.555, p = .577$ .

29.  $\chi^2$  one variable test:

$$H_0: \Sigma(O-E)^2 = 0$$

$$H_1: \Sigma(O-E)^2 \neq 0$$

Two-tailed

$$\alpha = .05$$

	0	1	2	3
Obs	10	16	22	12
Exp	15	15	15	15
O-E	-5	1	7	-3
(O-E) <sup>2</sup>	25	1	49	9
(O-E) <sup>2</sup> /E	1.67	0.07	3.27	0.6

$$\chi^2 = 5.61, df = N - 1 = 3, \text{critical } \chi^2 = 9.488$$

Fail to reject  $H_0$  because  $5.61 < 9.488$

Insufficient evidence to conclude that the observed values are different from the expected (equal) values.

30.  $H_0: \mu_{25\%} = \mu_{95\%}$   $H_0: \mu_{70\%} = \mu_{85\%}$   $H_0: \mu_{25\%,70\%} = \mu_{25\%,85\%}$   
 $= \mu_{95\%,70\%} = \mu_{95\%,85\%}$

$H_1: \text{not } H_0$       $H_1: \text{not } H_0$       $H_1: \text{not } H_0$

All hypotheses are two-tailed

$$\alpha = .05$$

There probably is a main effect of temperature

$(F(1, 36) = 20.848, p \leq .0005, MSe = 1.642, \alpha = .05)$ .

There probably is a main effect of humidity ( $F(1, 36) = 9.518, p = .004$ ).

There probably is not an interaction of temperature and humidity ( $F(1, 36) = 3.025, p = .183$ ).

