**RMTD 483 Final Exam**

**Select either “True” or “False” for questions 1 through 4.**

1. If and , then **A**+**B** does not exist.

2. An identity matrix is always a symmetric matrix.

3. Multivariate Analysis of Variance (MANOVA) is an extension of analysis of variance with more than one independent variable.

4. One of the advantages of MANOVA is that it may be able to detect combined differences in the dependent variables not found by examining the dependent variables independently of one another.

**[For questions 5-8]**

A psychologist Lucy was interested in gauging the success of a mood manipulation during one of her experiments. She had three groups of participants who underwent different types of mood induction: disgust mood induction, negative mood induction and positive mood induction. After the mood induction, participants were asked to endorse nine statements relating to their mood on a 100 point scale from 1—disagree to 100—agree: (1) When you’re smiling the whole world smiles with you, (2) I love the pretty flowers, (3) I could never touch a dead body, (4) I would never eat cat food, (5) If someone served me monkey brain soup I would vomit, (6) I feel fed up, (7) Bodily fluids are nasty, (8) I could not drink from a glass that I’d used to catch a spider, (9) I am a worthless piece of scum.

This psychologist performed a MANOVA to see if the mood inductions had an effect on responses to these 9 items

Use the following outputs to answer the questions 5 through 8.



**[For question 9]**

The psychologist Lucy wondered if the differences among three groups found in the previous analysis was contributed to the participant’s mood status before the induction started. She had the measure of the mood status before the experiment (pre-mood) and decided to use this continuous variable as a covariate to run an MANCOVA to test the same research question as stated earlier.

Answer Question 9.

**[For question 10]**

A researcher was interested in knowing whether students with different socio-economic status (*CATses*: low/median/high) shared the same profile of the achievement scores on four different subjects (*Subject*: Reading/Math/Science/History). He conducted a profile analysis to compare the profiles of the achievement across three socio-economic status groups. The outputs are as follows.

**[A1]**



**[A2]**



**[A3]**



Answer question 10.

**[For questions 11-15]**

A researcher ran a discriminant analysis to test whether she can use the achievement scores (Reading, Math, Science, and History) to identify student’s gender (male/female). SPSS output for this analysis are as follows:

Answer questions 11 through 15 use the outputs [**B1**] to [**B6**].

**[B1]**

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**[B2]**

****

**[B3]**

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**[B4]**

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**[B5]**

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**[B6]**

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**[For questions 16-18]**

A canonical correlation was run to explore the relationship between student’s psychological measures (locus\_of\_control “*f1locus2*” and self-concept “*f1cncpt2*”) and student’s achievement (reading “*f1txrstd*”, math “*f1txmstd*”, science “*f1txsstd*”, and history “*f1txhstd*”). The SPSS outputs for this analysis are as follows.

Answer questions 16 to 18 based on the outputs [**C1**] to [**C5**].

**[C1]**

Canonical Correlations

1 .299

2 .060

**[C2]**

Test that remaining correlations are zero:

Wilk's Chi-SQ DF Sig.

1 .907 23.552 8.000 .003

2 .996 .863 3.000 .834

**[C3]**

Standardized Canonical Coefficients for Set-1

1 2

f1locus2 -1.120 -.479

f1cncpt2 .246 1.193

Standardized Canonical Coefficients for Set-2

1 2

f1txrstd -.295 -1.173

f1txmstd -.790 -.377

f1txsstd .299 .159

f1txhstd -.222 1.587

**[C4]**

Canonical Loadings for Set-1

1 2

f1locus2 -.979 .202

f1cncpt2 -.393 .919

Canonical Loadings for Set-2

1 2

f1txrstd -.873 -.118

f1txmstd -.962 -.014

f1txsstd -.658 .230

f1txhstd -.807 .516

**[C5]**

Proportion of Variance of Set-1 Explained by Its Own Can. Var.

Prop Var

CV1-1 .557

CV1-2 .443

Proportion of Variance of Set-1 Explained by Opposite Can.Var.

Prop Var

CV2-1 .050

CV2-2 .002

Proportion of Variance of Set-2 Explained by Its Own Can. Var.

Prop Var

CV2-1 .693

CV2-2 .083

Proportion of Variance of Set-2 Explained by Opposite Can. Var.

Prop Var

CV1-1 .062

CV1-2 .000