TU059/TU060/TU256/PhD Probability and Statistical Inferences
PSI CA Part II Marking Scheme/Rubric

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Marking Breakdown

ASPECT	ISSUES CONSIDERED	OVERALL MARKS
HYPOTHESES	• The ability to correctly develop and present hypotheses suitable for testing using dimension reduction and either linear and logistic regression.[1] • Note: At least 4 hypotheses required (dimension reduction, linear regression, logistic regression, comparison)	10 marks
DIMENSION REDUCTION	• Description of the conduct and outcomes of the dimension reduction technique • Critical discussion of effectiveness of the dimension reduction technique including description of the outcomes.	10 marks 17 marks
LINEAR REGRESSION	• The ability to correctly prepare, present, analyse and critically assess the dataset used for the purposes of building the proposed linear regression. • Model– description of conduct and outcomes, assessment of fit and usefulness, illustration of usefulness. • Critical discussion of model and overall conclusion.	10 marks 10 marks 6 marks
LOGISTIC REGRESSION	• The ability to correctly prepare, present, analyse and critically assess the dataset used for the purposes of building the proposed logistic regression. • Model – description of conduct and outcomes, assessment of fit and usefulness, illustration of usefulness. • Critical discussion of model including overall conclusion.	10 marks 10 marks 6 marks
COMPARISON MODEL	• Model - description conduct and outcomes, assessment of fit and usefulness, illustration of usefulness. • Critical discussion of model including relevant statistical comparison with baseline model and overall conclusion	10 marks 6 marks
	Total Marks Available[2]	**100 marks**

ACHIEVEMENT	EXCELLENT	SATISFACTORY	BASIC		UNSATISFACTORY
% OF MARKS AVAILABLE	> 75%	55-75%	40-55%		<40%

Key Characteristics associated with each achievement level for each aspect are described on the next pages.[3]

[1] At least one of your hypotheses for regression must involve a differential effect and therefore at least one of your models needs to include a nominal variable as a predictor.

[2] The task will be marked out of 100 and your result will be weighted to reflect the 60% of this task in the calculation of the overall module marks.

[3] The characteristics described below in the rubric are for a student submission which addresses all components of the assignment. Where a student attempts fewer components, the marks achieved will depend on how many questions have been addressed and the level of achievement for each question. For example, if a student attempts only THREE components, but completes everything to the level indicated by the category of EXCELLENT, their mark will not reach the level associated with this category but with a lower a category.

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HYPOTHESES Rubric

HYPOTHESES KEY CHARACTERISTICS OF ACHIEVEMENT LEVELS			
EXCELLENT	**SATISFACTORY**	**BASIC**	**UNSATISFACTORY**
• Correctly states hypotheses in a manner that supports investigation using the relevant technique. • 4 hypotheses included.	• States hypotheses for each technique with some minor errors, but which are still suitable for investigation using the relevant technique. • 4 hypotheses included.	• States hypotheses for each technique with some minor errors, but which are still suitable for investigation using the relevant technique. • 4 hypotheses included.	• Hypotheses are either not included or contain significant errors which render them useless.

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DIMENSION REDUCTION Rubric

DIMENSION REDUCTION KEY CHARACTERISTICS OF ACHIEVEMENT LEVELS			
EXCELLENT	**SATISFACTORY**	**BASIC**	**UNSATISFACTORY**
• Clearly identifies the variables chosen. • Chooses the correct approach (PCA/EFA) and justifies choice. • Correctly examines the variables chosen to determine reliability. • Critically discusses the reliability, implications and choices resulting. • Correctly conducts and presents the outcomes of checks to establish the data is suitable generating appropriate statistics. • Critically examines the results of the checks to establish the data is suitable, implications and choices resulting. • Correctly conducts the dimension reduction, describing the conduct with relevant statistics and presenting the relevant outcomes. • Critically examines the findings and how these influenced the choice of factors to retain. • Draws relevant conclusions for the related hypothesis and describes factors/components extracted.	• Clearly identifies the variables chosen. • Chooses the correct approach (PCA/EFA) and justifies choice. • Correctly examines the variables chosen to determine reliability. • Discusses the reliability, implications and choices resulting with some minor omissions/errors. • Correctly conducts and presents the outcomes of checks to establish the data is suitable generating appropriate statistics. • Discusses the results of the checks to establish the data is suitable, examining some implications and choices resulting with some minor omissions/errors. • Correctly conducts the dimension reduction, describing the conduct with relevant statistics and presenting the relevant outcomes with minor errors in interpretation. • Describes the factors/components extracted with an effort to explain choices made.	• Clearly identifies the variables chosen. • Chooses the correct approach (PCA/EFA). • Presents the reliability analysis for the variables chosen and discusses the implications with some errors. • Correctly conducts and presents the outcome of checks to establish the data is suitable generating appropriate statistics with some errors/omissions. • Correctly conducts the dimension reduction, describing the conduct with relevant statistics and presenting the relevant outcomes with some minor errors/omissions. • Describes the factors/components extracted.	• Either no reliability analysis or significant errors in the conduct of the reliability analysis. • Conducts and presents some of the checks to establish the data is suitable generating appropriate statistics/presents the checks with errors. • Presents some relevant statistics and graphs from the conduct of the dimension reduction – errors obvious in the use of the outcomes. • States some factors/components extracted – errors obvious in the choice.

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LINEAR REGRESSION Rubric

Linear Regression KEY CHARACTERISTICS OF ACHIEVEMENT LEVELS			
EXCELLENT	**SATISFACTORY**	**BASIC**	**UNSATISFACTORY**
• Clearly presents evidence for including predictors illustrated using appropriate statistics and visuals. • Correctly creates the model and presents relevant statistics on the fit and usefulness of the model overall and the co-efficients. • Illustrates the findings for relevant sample data. • Conducts the relevant checks for assumptions and presents the findings using appropriate statistics and visuals. • Critically discusses implications of assessment of assumptions. • Critically discusses the implications of the findings for the related hypothesis.	• Clearly presents evidence for including predictors illustrated using appropriate statistics and visuals. • Correctly creates the model and presents relevant statistics on the fit and usefulness of the model overall and the co-efficients with some minor omissions/errors. • Illustrates the findings for relevant sample data with some minor omissions/errors. • Conducts the relevant checks for assumptions and presents the findings using appropriate statistics and visuals with some minor omissions/errors with some attempt to discuss the implications. • States a conclusion for related hypothesis.	• Presents evidence for including predictors illustrated using appropriate statistics and visuals with some minor omissions. • Correctly creates the model and presents relevant statistics on the fit and usefulness of the model overall and the co-efficients with some minor omissions. • A basic effort to illustrate the findings. • A basic effort to examine some of the assumptions supported by relevant statistics. • States a conclusion for related hypothesis.	• Does not present sufficient evidence for including predictors illustrated using appropriate statistics and visuals. • Creates the model but does not examine or present the fit and usefulness of the model appropriately. • No effort to illustrate the usefulness of the model. • No effort to draw conclusion for the related hypothesis.

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LOGISTIC REGRESSION Rubric

LOGISTIC REGRESSION KEY CHARACTERISTICS OF ACHIEVEMENT LEVELS			
EXCELLENT	**SATISFACTORY**	**BASIC**	**UNSATISFACTORY**
• Clearly presents evidence for including predictors illustrated using appropriate statistics and visuals. • Correctly creates the model and presents relevant statistics on the fit and usefulness of the model overall and the co-efficients. • Illustrates the findings for relevant sample data. • Conducts the relevant checks for assumptions and presents the findings using appropriate statistics and visuals. • Critically discusses implications of assessment of assumptions. • Critically discusses the implications of the findings for the related hypothesis.	• Clearly presents evidence for including predictors illustrated using appropriate statistics and visuals. • Correctly creates the model and presents relevant statistics on the fit and usefulness of the model overall and the co-efficients with some minor omissions/errors. • Illustrates the findings for relevant sample data with some minor omissions/errors. • Conducts the relevant checks for assumptions and presents the findings using appropriate statistics and visuals with some minor omissions/errors with some attempt to discuss the implications. • States a conclusion for related hypothesis.	• Presents evidence for including predictors illustrated using appropriate statistics and visuals with some minor omissions. • Correctly creates the model and presents relevant statistics on the fit and usefulness of the model overall and the co-efficients with some minor omissions. • A basic effort to illustrate the findings. • A basic effort to examine some of the assumptions supported by relevant statistics. • States a conclusion for related hypothesis.	• Does not present sufficient evidence for including predictors illustrated using appropriate statistics and visuals. • Creates the model but does not examine or present the fit and usefulness of the model appropriately. • No effort to illustrate the usefulness of the model. • No effort to draw conclusion for the related hypothesis.

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COMPARISON MODEL Rubric

LOGISTIC REGRESSION KEY CHARACTERISTICS OF ACHIEVEMENT LEVELS			
EXCELLENT	**SATISFACTORY**	**BASIC**	**UNSATISFACTORY**
• Addresses all the criteria for the original model as outlined above for the EXCELLENT level. • PLUS • Discusses the inclusion/removal of predictor(s) presenting appropriate statistics and visuals if including. • Critically compares the fit and usefulness and assumptions checks of the model to the baseline model. • Critically discusses the implications of the findings for the related hypothesis.	• Addresses all the criteria for the original model as outlined above to the SATISFACTORY level. • PLUS • Discusses the inclusion/removal of predictor(s) presenting appropriate statistics and visuals if including. • Critically compares the fit and usefulness of the model to the baseline model with some minor errors/omissions. • States a conclusion for related hypothesis.	• Addresses all the criteria for the original model as outlined above to the BASIC level. • PLUS • States the predictor(s) included/removed. • States differences with baseline model but no discussion included. • States a conclusion for related hypothesis.	• Addresses all the criteria for the original model as outlined above to the UNSATISFATORY level. • PLUS • No effort to compare models. • No effort to draw conclusion for the related hypothesis.