



CINEC Campus

Faculty of Management and Social Sciences  
Department of Logistics and Transport  
BSc (Hons) Logistics and Transportation  
Course CODE: COM551

Year 3 Semester 2

END SEMESTER EXAMINATION

Research Methodology – LTRM3214



- This paper consists of SEVEN (07) questions on EIGHT (08) pages.
- Answer Only FOUR (04) Questions including Question 01.
- Only Non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write legibly.

Date: 2023.03.28

Pass mark: 50%

Time: 02 Hours

### Question: 01 (Compulsory)

#### Multiple Choice

For each question there are four possible answers a, b, c and d. Choose the one you consider correct and record your choice in the given sheet. Each correct answer will score 1.25 marks. A mark will not be deducted for a wrong answer.

- 1) Research can be conducted by a person who:
  - a) has studied research methodology.
  - b) holds a postgraduate degree.
  - c) possesses thinking and reasoning ability.
  - d) is a hard worker.

2) Which of the following is not the Method of Research?

- a) Observation
- b) Historical
- c) Survey
- d) Philosophical

3) The first step of research is:

- a) Identifying a problem
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4) The study in which the investigators attempt to trace an effect is known as:

- a) 'Ex-post Facto' Research
- b) Survey Research
- c) Historical Research
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5) The experimental study is based on:

- a) The manipulation of variables
- b) Conceptual parameters
- c) Replication of research
- d) Survey of literature

6) Which one is called non-probability sampling?

- a) Quota sampling
- b) Cluster sampling
- c) Systematic sampling
- d) Stratified random sampling.

7) Fieldwork based research is classified as:

- a) Empirical
- b) Historical
- c) Experimental
- d) Biographical

8) The process not needed in experimental research is:

- a) Observation
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9) A conceptual framework is used to,

- a) Illustrate the variables you will study and the relationships you expect to find between them.
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10) A null hypothesis is,

- a) when there is no difference between the variables
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- c) subjective in nature
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11) The list of all units in a population is called,

- a) Sampling frame
- b) Parameter
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- 12) The data which are collected for the first time by the investigator is called,
- a) Primary data
  - b) Secondary Data
  - c) Both (a) and (b)
  - d) None of these
- 13) Heterogenous group are classified into Homogenous group and then randomly sample is chosen refers to,
- a) Stratified Random sampling.
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- a) Census
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  - c) Interview
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- 15) Research related to abstract ideas or concepts is,
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- 16) A systematic literature review is:
- a) One which starts in your own library, then goes to on-line databases and, finally, to the internet.
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17) Bibliography means,

- a) Foot Note
- b) List of Books referred.
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18) A researcher wants to study the future of the Congress in India. For the study which tool is most appropriate for him?.

- a) Schedule
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19) What is self-plagiarism ?.

- a) Taking about yourself too much
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- d) A paraphrase style of reviewing which does not require referencing.

**Question: 02**

- a) Briefly describe the difference between the null hypothesis and alternate hypothesis with the aid of an example. (06 Marks)
- b) What is the importance of research and why people conduct research?. Analyze the statement with the aid of an example. (07 Marks)
- c) A research design also called a research strategy, is a plan to answer a set of questions. It is a framework that includes the methods and procedures to collect, analyze, and interpret data. Analyze the statement by providing suitable examples to support your answer. (12 Marks)

**Question: 03**

- a) Describe, how to avoid plagiarism in research papers. (05 Marks)
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**Question: 04**

- a) What are the factors that you need to consider when you refer scholarly articles ? (05 Marks)
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- c) Briefly explain the relationship between conceptual framework and operational framework with the aid of an example. (07 Marks)
- d) What are the types of plagiarism and briefly explain 02 types of plagiarism with the aid of an example. (07 Marks)

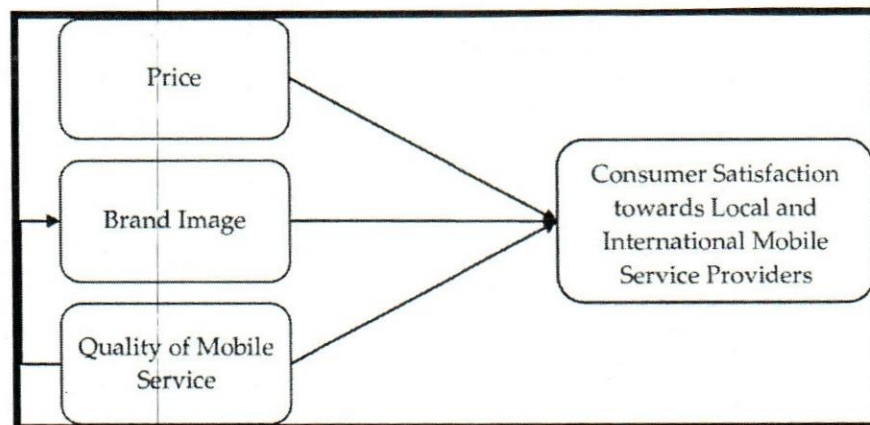
**Question : 05**

- a) Determine the components of research triangulation. (04 Marks)
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- d) "Product Research is the process of determining whether your idea for a new product or service might be successful and how best to develop and sell that product". Briefly explain the statement with the aid of a suitable example. (08 Marks)

**Question: 06**

- a) Briefly explain the term of **Theoretical framework** with the aid of an example. (06 Marks)
- b) Central Bank of Sri Lanka is published many annual publications. Briefly explain, what are the publications they do annually and describe the significance of secondary data sources. (07 Marks)
- c) The following Conceptual Framework is extracted from a study conducted by one of the Bangladesh scholars published in reputed journal. Develop at least two questions for the independent variables and for the dependent variable. (12 Marks)

Conceptual Framework of the customer satisfaction on local and foreign telecommunication companies in Bangladesh. Khondaker, K (2017)



**Question: 07****Part - A**

Empirically, planning is a very strong predictor of wealth; those who plan arrive close to retirement with two to three times the amount of wealth as those who do not plan (Lusardi and Mitchell, 2011b). Paraphrase the statement using the knowledge of reference and citation. (05 Marks)

**Part - B**

Briefly describe the following terms with the aid of an example.

Answer only 04 questions.

- I. Systematic sampling
- II. Research Questions
- III. Deductive Approach
- IV. Descriptive Statistics
- V. Secondary Data
- VI. Quantitative Research
- VII. Pilot Study
- VIII. Study Population

(04\*05 Marks)

-----END OF THE QUESTION PAPER-----





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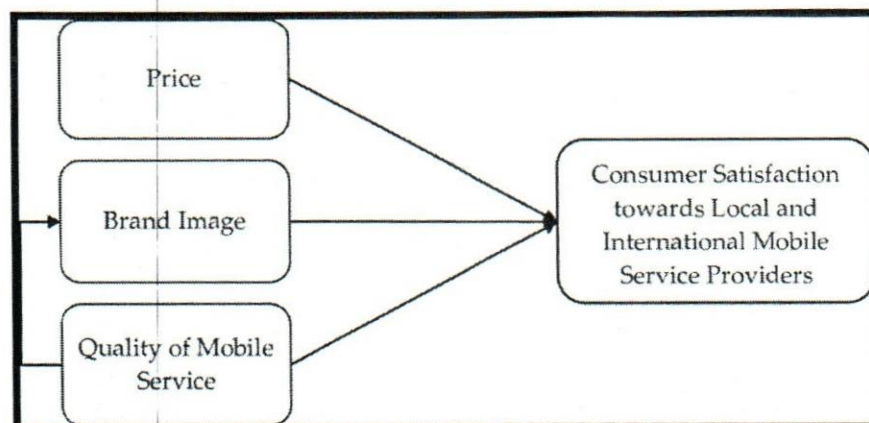
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(04\*05 Marks)

-----END OF THE QUESTION PAPER-----



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Year 3 Semester II  
SEMESTER END EXAMINATION  
Marketing Management– LTMM3212

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Date: 2023.03.24

Pass mark: 50%

Time: 02 Hours

**Question 01: (Compulsory)**

**Broadway Kids (Pvt) Limited**

Broadway Kids (Pvt) Limited is a privately owned, family run business founded in 2012 by the two siblings Mano & Chula. Broadway Kids designs and manufactures clothing and accessories for babies and children.

Company is certified under SEDEX (Supplier Ethical Data Exchange) & Global Organic Textile Standard (GOTS), with many years of experience of working with international high street retailers such as Next, Mamas and Papas and Natures Purist. The company mission is to excel in manufacturing small order quantities to world renown small and medium retailers by innovating and perfecting the mechanisms and processes whilst maintaining high quality and safety standards.

The company take quality and safety very seriously and operate inline QC inspections at every stage as well as online pull tests for button and stopper security. Company has metal free factory and operate a strict broken needle policy. All production is 100% metal detected prior to packing.

However, recent situation in the country has created unfavorable situation for the

whole textile and apparel industry. Sri Lanka kicked off 2022 with an overwhelming apparel export figures of US \$ 487.60 million in January, noting an impressive 23 per cent growth over January '21, which was the highest in last six years. Subsequently, in February '22, the apparel exports reached US \$ 468.12 million, growing by around 11.54 per cent on year-on-year basis. However, it didn't take much time for the scenario to change - and change for the worst. The country's foreign exchange reserves slumped by 70 per cent to US \$ 2.30 billion as of February '22 in the past two years, thereby impacting the country's ability to import food and fuel - eventually leading to power cuts and skyrocketing prices.

With no electricity for 12 hours a day, the country has been going through a major energy crisis. Also, with food prices going very high, Sri Lanka is presently battling one of its worst economic crises. Yohan Lawrence, Secretary General, JAAF (Joint Apparel Associate Forum), said "The fuel shortage is having a massive impact on our day-to-day production. We are unable to use our generators during power outages because of the lack of diesel. To add to this, fuel shortages are affecting our ability to transport our goods and provide staff transport for our employees". The rising cost of shipping and logistics has been a growth impediment factor in the apparel industry. However, bigger manufacturers are still managing somehow owing majorly to their multi-national manufacturing operations.

The story, unfortunately, isn't same for small manufacturers! While incessant power cuts and increasing shortage of diesel seem to have hit their functioning of work more, other forms of disruptions too have been causing bottlenecks. Amidst anti-Government protests across the country, workers struggle to reach their factories because of lack of transportation, which has consequently impacted the smaller players more than the bigger ones. Lack of workers amidst uncertainty and chaos has significantly hit the production in last one month. "We operate on very thin margins," commented Chula Dharmadasa, Owner, Broadway Kids, adding, "I'm already getting warnings from clients that if we miss delivery targets, we must air freight goods, which we cannot afford to do. Our orders will get cancelled and buyers will move to competitors like Bangladesh."

When a country faces such overwhelming economic crisis, especially due to political failure, there is certain distrust amongst buying fraternity for that country. The same is feared by Sri Lankan apparel industry, which has always believed to maintain a high level of confidence amongst apparel buyers across the globe. "If our buyers start losing confidence in us and move to other competing markets, getting them back will be extremely challenging," Lawrence substantiates.

This is not the first time Sri Lanka is going through a tough time and this is not the first time the apparel industry of the country is facing challenges and constraints. There's hope for revival!

*The above data has been based on a real-life organisation, but details have been changed for assessment purposes and do not reflect current management practices.*

*Adapted, Apparel Resources. com (2022)*

You are required to produce a SWOT analysis for Broadway Kids (Pvt) Limited using the information given in the case study. (25 Marks)

## **Question 02**

You are the Marketing Director of a manufacturer of high-quality, luxury bathroom fittings & equipment such as washbasins to mirrors, lighting and shelves, and is planning to introduce a new range of luxury bathroom accessories,

- (a) What is a product? (05 Marks)
- (b) With the aid of a diagram, discuss the key stages of the product life cycle. (15 Marks)
- (c) Identify and explain the suitable strategy when deciding the number of marketing intermediaries for the company. (05 Marks)

**Question 03**

You work for a large cosmetics company operating in the FMCG industry. The management is presently in the process of establishing a business outlet in a new geographical area. As the assistant sales manager, you are required to,

- (a) Recommend three (03) suitable communication tools that the company could use to capture the new market. (15 Marks)
- (b) "There are several factors affecting the pricing decision". Explain five (05) such factors that will affect the pricing decision on the new market. (10 Marks)

**Question 04**

For many years the business for which you work as Marketing Director has been engaged in manufacturing general engineering products, but the sales and profits have long been declining. You believe that wind power generators could become a major growth business in the future. You are required to;

- (a) Advise how company could segment the market for its new product recommending three (03) main bases (Highlighting the sub-bases) company could use to segment the market. (15 Marks)
- (b) Evaluate two suitable point of differentiation (value differences) company could use when they position its new product. (10 Marks)

**Question 05**

Choose ONE of the following businesses:

- I. Airline
- II. Biscuits
- III. Cosmetic

- (a) Identify three (03) major factors (buyer characteristics) that could influence their behavior when choosing the product/service of your choice (You are required discuss minimum of two sub factors as well). (15 Marks)

- (b) With reference to the consumer buyer decision process, explain the five (05) stages a consumer may go through in selecting product/service of your choice above. (10 Marks)

### **Question 06**

You are the Marketing Advisor to a small B2B marketing communications agency which, principally serves small businesses in the local area. In a recent meeting the company CEO revealed his intention to have a well-resourced and managed Marketing Information System (MkIS). As Marketing Advisor, prepare a brief report addressing CEO that explain the importance of having a MkIS and how MkIS should function for the communications agency to make correct decision in this turbulent environment. (25 Marks)

### **Question 07**

You work for a large national insurance company based in a country of your choice. You have been asked by your manager to produce a report for all local and regional managers, that explain how the extended marketing mix elements could be used to gain competitive advantage for the company. (25 Marks)

-----END OF THE QUESTION PAPER-----



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Year 3 Semester II

## SEMESTER END EXAMINATION

### Transport Contract and Regulations – LTTR3213

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Date: 2023.03.22

Pass mark: 50%

Time: 02 Hours

#### Question 01: Compulsory

Discuss the elements of a valid contract with reference to case law.

(25 marks)

#### Question 02

(a) Explain the types of laws in Sri Lanka.

(10 marks)

(b) Compare and contrast the difference between Civil law and Criminal law.

(10 marks)

(c) Explain the Court hierarchy of Sri Lanka.

(5 marks)

#### Question 03

(a) What are terms and conditions in a contract?

(5 marks)

(b) What are the differences between unilateral and bilateral contracts?

(10 marks)

(c) Write a case note on the landmark case of *Carlill v Carbolic Smoke Ball Company* [1892]

(10 marks)

#### Question 04

(a) What is an "Agency" and explain the methods of creating an Agency

(10 marks)

(b) List down the duties and rights of an agent

(10 marks)



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(c) Describe the modes of termination of agencies.

(5 marks)

### Question 05

Explain the legal and equitable remedies available under the law of Contract.

(25 marks)

### Question 06

Read the following scenario and advise the parties.

Avishka is known to be a very talented and a clever young artist among his friends. In 2022 December during the annual talent show held at CINEC Campus Avishka became the most popular singer of the year. This year the student union at CINEC Campus has decided to hold a grand concert in Lotus theaters Colombo for the first time after the Covid 19 pandemic in order to raise funds to install a new gym for the Camps. When the student union made this offer to Avishka he gladly accepted stating that he doesn't need the money but he would perform five songs at the concert.

Sansla, another undergraduate of the Campus also became the first runner up Dancer in the talent show. However, none of the students voted for hence she didn't become the most famous Dancer. The Students claim that she is not a good dancer but her father has connections with the organizers of the talent show and that's why she became the most talented dancer. Despite this controversy, the student union decides to invite her to perform at the concert. Sansala who is still mad at the students for not voting for her at the talent show decided to charge Rs: 10,000 per dance. Even though her charges are higher for a charity event, the student union decided to hire her for the even thinking that her father might do something to cancel the concert.

Both Sansala and Avishka agreed to come for rehearsals during the first week before the concert. However, over the practices Sansala and Avishka gets to know each other and start a relationship. On the very first day of the rehearsing week Sansala and Avishka agreed to go on a movie date. On their way to the Cinem Sansala remembers about the Rehearsals and rushes back to the campus. Meanwhile, Anishka gets heartbroken for being stood up on their first movie date and doesn't show up for three days from the rehearsals.

Yasas is the president of the student union and has developed a crush on Sansala and he is really mad at Avishkka for starting a relationship with her. Being furious at Avishka Yasas informs Avihka that they have decided to terminate his contract for being unable to attend the rehearsals properly. Not only that, Yasas hires Nirodh a thug in the campus to break both legs of Avishka before the day of the concert. Nirodh accept the offer and demands to pay him Rs. 50,000. The day before the concert Nirodh fulfills his obligations by breaking Avishka's legs.

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On the first day of the concert Sansala's father falls ill and she fails to make it to the concert on time and the student union decided to terminate the contract with her and immediately hires Shenali as the dancer.

**Advise the following**

- (a) After performing the terms in the contract Nirodh is now demanding the money due to him from Yasas.
- (b) Avishka is calming that he had to cancel his other appointments to perform at CINEC concert and demanding the student union to pay for the loss incurred to him.
- (c) Sansala claims that unlike Avishka she participated in each and every reversal and he Student union cannot terminate the contract with her for being absent jut for a day.

(25 marks)

**Question 07**

Write short notes on the following topics.

- (a) Sources of law.
- (b) Exclusion clauses.
- (c) Innominate terms.
- (d) Frustration of contract.
- (e) Three branches of the Government

(5×5 marks)

-----END OF THE QUESTION PAPER-----





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(10 marks)

(b) List down the duties and rights of an agent

(10 marks)



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(c) Describe the modes of termination of agencies.

(5 marks)

### Question 05

Explain the legal and equitable remedies available under the law of Contract.

(25 marks)

### Question 06

Read the following scenario and advise the parties.

Avishka is known to be a very talented and a clever young artist among his friends. In 2022 December during the annual talent show held at CINEC Campus Avishka became the most popular singer of the year. This year the student union at CINEC Campus has decided to hold a grand concert in Lotus theaters Colombo for the first time after the Covid 19 pandemic in order to raise funds to install a new gym for the Camps. When the student union made this offer to Avishka he gladly accepted stating that he doesn't need the money but he would perform five songs at the concert.

Sansala, another undergraduate of the Campus also became the first runner up Dancer in the talent show. However, none of the students voted for hence she didn't become the most famous Dancer. The Students claim that she is not a good dancer but her father has connections with the organizers of the talent show and that's why she became the most talented dancer. Despite this controversy, the student union decides to invite her to perform at the concert. Sansala who is still mad at the students for not voting for her at the talent show decided to charge Rs: 10,000 per dance. Even though her charges are higher for a charity event, the student union decided to hire her for the even thinking that her father might do something to cancel the concert.

Both Sansala and Avishka agreed to come for rehearsals during the first week before the concert. However, over the practices Sansala and Avishka gets to know each other and start a relationship. On the very first day of the rehearsing week Sansala and Avishka agreed to go on a movie date. On their way to the Cinem Sansala remembers about the Rehearsals and rushes back to the campus. Meanwhile, Anishka gets heartbroken for being stood up on their first movie date and doesn't show up for three days from the rehearsals.

Yasas is the president of the student union and has developed a crush on Sansala and he is really mad at Avishkka for starting a relationship with her. Being furious at Avishka Yasas informs Avihka that they have decided to terminate his contract for being unable to attend the rehearsals properly. Not only that, Yasas hires Nirodh a thug in the campus to break both legs of Avishka before the day of the concert. Nirodh accept the offer and demands to pay him Rs. 50,000. The day before the concert Nirodh fulfills his obligations by breaking Avishka's legs.

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On the first day of the concert Sansala's father falls ill and she fails to make it to the concert on time and the student union decided to terminate the contract with her and immediately hires Shenali as the dancer.

**Advise the following**

- (a) After performing the terms in the contract Nirodh is now demanding the money due to him from Yasas.
- (b) Avishka is calming that he had to cancel his other appointments to perform at CINEC concert and demanding the student union to pay for the loss incurred to him.
- (c) Sansala claims that unlike Avishka she participated in each and every reversal and he Student union cannot terminate the contract with her for being absent jut for a day.

(25 marks)

**Question 07**

Write short notes on the following topics.

- (a) Sources of law.
- (b) Exclusion clauses.
- (c) Innominate terms.
- (d) Frustration of contract.
- (e) Three branches of the Government

(5×5 marks)

-----END OF THE QUESTION PAPER-----

Library

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Year 3 Semester II

SEMESTER END EXAMINATION

Econometrics – LTEC3211

- This paper consists of SEVEN questions on FIVE (05) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.
- Formulae sheet and required tables are attached.

Date: 2023.03.20

Pass mark: 50%

Time: 02 Hours

### Question 01 (Compulsory)

“Econometrics consists of economic measurements and lends empirical supports to the models constructed in mathematical economics”

- Briefly describe this statement. (05 Marks)
- Define theoretical and applied econometrics with example. (08 Marks)
- Describe the types of data and analytical techniques. (12 Marks)

### Question 02

- Explain the “Estimate” and “Estimator”. (06 Marks)
- Describe the “Law of Statistical Regularity” and “Law of Inertia”. (06 Marks)

- (c). What is meant by "Central Limit Theorem"? (06 Marks)
- (d). What are the attributes of Normal distribution? (07 Marks)

### Question 03

- (a). A sample size of 200 has 45.6 and 3.2 mean and standard deviation respectively. Calculate standard error and margin of error at 95% level of confidence. (06 Marks)
- (b). You have been appointed to estimate the average weight of a product at 95% level of confidence. When a sample size of 100 is analysed, the average weight of a product is 30.5 kg with a standard deviation of 6.3 kg. Estimate the average weight of the product at 95% confidence. (07 Marks)
- (c). There are two companies which produce same products in two brands. It is expected to estimate the difference of the life time between the two brands. Selecting 10 items from each brand, life time has been calculated and information is provided below. Estimate the difference of the life time between the two brands.

Brand 1 (Years)	4	4	4	3	3	4	3	3	3	4
Brand 2 (Years)	4	3	3	4	3	3	4	3	4	3

(12 Marks)

### Question 04

- (a). Describe the "Null" and " Alternative" hypotheses. (04 Marks)
- (b). What are the types of errors in hypothesis tests? (04 Marks)
- (c). The management of a company says that the weight of a product is 50kg in average. You have been appointed to test the statement of the management. Selecting eight items, weight has been measured and information is

provided by the following table. Test the statement at 5% level of significance.

Weight in kg	52	49	49	46	47	51	49	51
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(08 Marks)

- (d) The management of two companies say that there is not a difference between two products in relation to weight. Selecting 10 items from each company, weight has been calculated and information is provided below. Test the management statement at 5% level of significance.

Company 1 (Kg)	32	34	33	29	26	33	27	29	27	31
Company 2 (Kg)	32	28	28	32	29	27	33	28	32	26

(09 Marks)

### Question 05

- (a) What is the purpose of one way Analysis of Variance (ANOVA)?  
(05 Marks)
- (b) Three companies produce same product in three brands. They say that there is no difference in the life time of the products due to the companies. Selecting five items from each company, life time of the products has been estimated in years and the result is given in the following table. Test whether there is a significant difference between the three brands.

Company 1	Company 2	Company 3
19	17	19
15	16	19
18	22	20
17	23	19
21	22	18

(20 Marks)

**Question 06**

Following table provides information on price of a product and demand of a product in five districts.

Districts	Price	Demand
1	07	40
2	06	50
3	09	30
4	05	60
5	04	70

- (a) Calculate the coefficient of correlation between price and demand and interpret the results. (06 Marks)
- (b) Construct a Simple Regression Model to study the effect of the price on demand. (06 Marks)
- (c) What will be the demand if the price is Rs.3? (04 Marks)
- (d) Construct the regression ANOVA table and interpret the results (09 Marks)

**Question 07**

- (a). What is the meaning of non-stationary data and how you can use them to construct models to analyse data. (05 Marks)
- (a). You need to test stationary of Public Debt (PD) with drift and trend. Write a model for the Augmented Dickey Fuller (ADF) unit root test. (09 Marks)

- (c). It is expected to test whether Debt (D) granger courses Gross Domestic Production (GDP) in Sri Lanka. Two egression models have been constructed for 100 periods. Restricted and unrestricted models and Residual Sum of Square (RSS) are respectively provided for the models below. Take the decision using granger causality.

$$GDP_t = \beta_0 + \beta_1 GDP(-1)_t + u_t \quad RSS = 275.04$$

$$GDP_t = \beta_0 + \beta_1 GDP(-1)_t + \beta_2 D(-1)_t + u_t \quad RSS = 165.34$$

(11 Marks)

-----END OF THE QUESTION PAPER-----



## Formula sheet

$$\text{Mean} = \frac{\sum x}{n}$$

$$\text{Variance} = \frac{\sum(x-\bar{x})^2}{n-1}$$

$$(\bar{x}_1 - \bar{x}_2) \pm z_{\frac{\alpha}{2}} SE$$

$$SE = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$SE = SP \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

$$SP = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

$$TS = \frac{\bar{x} - \mu_0}{\frac{\sigma}{\sqrt{n}}}$$

$$TS = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$TS = \frac{\bar{x}_1 - \bar{x}_2}{SP \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$\text{Granger Causality (F)} = \frac{(RSS_R - RSS_{UR})/M}{RSS_{UR}/(N - K)}$$

*Coefficient of Correlation*

$$= \frac{n \sum xy - \sum x \sum y}{\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}}$$

## Normal Equations

$$Y = a + bx$$

$$\sum y = na + b \sum x$$

$$\sum xy = a \sum x + b \sum x^2$$

$$\text{Sum of Square of Regression} = \sum (\hat{Y} - \bar{Y})^2$$

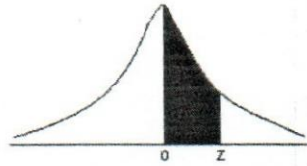
$$\text{Sum of Square of Residual} = \sum (Y - \hat{Y})^2$$

$$\text{Sum of Square of Total} = \sum (Y - \bar{Y})^2$$

$$\text{Sum of Square of Variance between groups} = \sum (\bar{X} - \bar{\bar{X}})^2$$

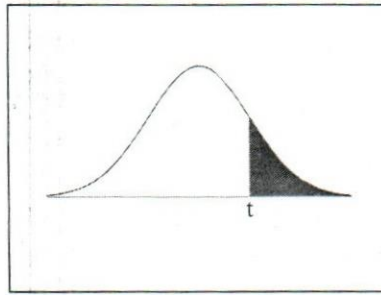
$$\text{Sum of Square of variance within groups} = \sum (X - \bar{X})^2$$

$$\text{Sum of Square of Total variance} = \sum (X - \bar{\bar{X}})^2$$



Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.49865	0.49869	0.49874	0.49878	0.49882	0.49886	0.49889	0.49893	0.49896	0.49900
3.1	0.49903	0.49906	0.49910	0.49913	0.49916	0.49918	0.49921	0.49924	0.49926	0.49929
3.2	0.49931	0.49934	0.49936	0.49938	0.49940	0.49942	0.49944	0.49946	0.49948	0.49950
3.3	0.49952	0.49953	0.49955	0.49957	0.49958	0.49960	0.49961	0.49962	0.49964	0.49965
3.4	0.49966	0.49968	0.49969	0.49970	0.49971	0.49972	0.49973	0.49974	0.49975	0.49976
3.5	0.49977	0.49978	0.49978	0.49979	0.49980	0.49981	0.49981	0.49982	0.49983	0.49983

## t-Distribution Table



The shaded area is equal to  $\alpha$  for  $t = t_{\alpha}$ .

$df$	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
32	1.309	1.694	2.037	2.449	2.738
34	1.307	1.691	2.032	2.441	2.728
36	1.306	1.688	2.028	2.434	2.719
38	1.304	1.686	2.024	2.429	2.712
$\infty$	1.282	1.645	1.960	2.326	2.576

**CRITICAL VALUES for the "F" Distribution, ALPHA = .05.**

00027

Denominator DF	Numerator DF									
	1	2	3	4	5	6	7	8	9	10
1	161.448	199.500	215.707	224.583	230.162	233.986	236.768	238.883	240.543	241.882
2	18.513	19.000	19.164	19.247	19.296	19.330	19.353	19.371	19.385	19.396
3	10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845	8.812	8.786
4	7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041	5.999	5.964
5	6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818	4.772	4.735
6	5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147	4.099	4.060
7	5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726	3.677	3.637
8	5.318	4.459	4.066	3.838	3.687	3.581	3.500	3.438	3.388	3.347
9	5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230	3.179	3.137
10	4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072	3.020	2.978
11	4.844	3.982	3.587	3.357	3.204	3.095	3.012	2.948	2.896	2.854
12	4.747	3.885	3.490	3.259	3.106	2.996	2.913	2.849	2.796	2.753
13	4.667	3.806	3.411	3.179	3.025	2.915	2.832	2.767	2.714	2.671
14	4.600	3.739	3.344	3.112	2.958	2.848	2.764	2.699	2.646	2.602
15	4.543	3.682	3.287	3.056	2.901	2.790	2.707	2.641	2.588	2.544
16	4.494	3.634	3.239	3.007	2.852	2.741	2.657	2.591	2.538	2.494
17	4.451	3.592	3.197	2.965	2.810	2.699	2.614	2.548	2.494	2.450
18	4.414	3.555	3.160	2.928	2.773	2.661	2.577	2.510	2.456	2.412
19	4.381	3.522	3.127	2.895	2.740	2.628	2.544	2.477	2.423	2.378
20	4.351	3.493	3.098	2.866	2.711	2.599	2.514	2.447	2.393	2.348
21	4.325	3.467	3.072	2.840	2.685	2.573	2.488	2.420	2.366	2.321
22	4.301	3.443	3.049	2.817	2.661	2.549	2.464	2.397	2.342	2.297
23	4.279	3.422	3.028	2.796	2.640	2.528	2.442	2.375	2.320	2.275
24	4.260	3.403	3.009	2.776	2.621	2.508	2.423	2.355	2.300	2.255
25	4.242	3.385	2.991	2.759	2.603	2.490	2.405	2.337	2.282	2.236
26	4.225	3.369	2.975	2.743	2.587	2.474	2.388	2.321	2.265	2.220
27	4.210	3.354	2.960	2.728	2.572	2.459	2.373	2.305	2.250	2.204
28	4.196	3.340	2.947	2.714	2.558	2.445	2.359	2.291	2.236	2.190
29	4.183	3.328	2.934	2.701	2.545	2.432	2.346	2.278	2.223	2.177
30	4.171	3.316	2.922	2.690	2.534	2.421	2.334	2.266	2.211	2.165
31	4.160	3.305	2.911	2.679	2.523	2.409	2.323	2.255	2.199	2.153
32	4.149	3.295	2.901	2.668	2.512	2.399	2.313	2.244	2.189	2.142
33	4.139	3.285	2.892	2.659	2.503	2.389	2.303	2.235	2.179	2.133
34	4.130	3.276	2.883	2.650	2.494	2.380	2.294	2.225	2.170	2.123
35	4.121	3.267	2.874	2.641	2.485	2.372	2.285	2.217	2.161	2.114
36	4.113	3.259	2.866	2.634	2.477	2.364	2.277	2.209	2.153	2.106
37	4.105	3.252	2.859	2.626	2.470	2.356	2.270	2.201	2.145	2.098
38	4.098	3.245	2.852	2.619	2.463	2.349	2.262	2.194	2.138	2.091
39	4.091	3.238	2.845	2.612	2.456	2.342	2.255	2.187	2.131	2.084
40	4.085	3.232	2.839	2.606	2.449	2.336	2.249	2.180	2.124	2.077
41	4.079	3.226	2.833	2.600	2.443	2.330	2.243	2.174	2.118	2.071
42	4.073	3.220	2.827	2.594	2.438	2.324	2.237	2.168	2.112	2.065
43	4.067	3.214	2.822	2.589	2.432	2.318	2.232	2.163	2.106	2.059
44	4.062	3.209	2.816	2.584	2.427	2.313	2.226	2.157	2.101	2.054
45	4.057	3.204	2.812	2.579	2.422	2.308	2.221	2.152	2.096	2.049
46	4.052	3.200	2.807	2.574	2.417	2.304	2.216	2.147	2.091	2.044
47	4.047	3.195	2.802	2.570	2.413	2.299	2.212	2.143	2.086	2.039
48	4.043	3.191	2.798	2.565	2.409	2.295	2.207	2.138	2.082	2.035
49	4.038	3.187	2.794	2.561	2.404	2.290	2.203	2.134	2.077	2.030
50	4.034	3.183	2.790	2.557	2.400	2.286	2.199	2.130	2.073	2.026

**CRITICAL VALUES for the "F" Distribution, ALPHA = .05.**

00027

Denominator DF	Numerator DF									
	1	2	3	4	5	6	7	8	9	10
51	4.030	3.179	2.786	2.553	2.397	2.283	2.195	2.126	2.069	2.022
52	4.027	3.175	2.783	2.550	2.393	2.279	2.192	2.122	2.066	2.018
53	4.023	3.172	2.779	2.546	2.389	2.275	2.188	2.119	2.062	2.015
54	4.020	3.168	2.776	2.543	2.386	2.272	2.185	2.115	2.059	2.011
55	4.016	3.165	2.773	2.540	2.383	2.269	2.181	2.112	2.055	2.008
56	4.013	3.162	2.769	2.537	2.380	2.266	2.178	2.109	2.052	2.005
57	4.010	3.159	2.766	2.534	2.377	2.263	2.175	2.106	2.049	2.001
58	4.007	3.156	2.764	2.531	2.374	2.260	2.172	2.103	2.046	1.998
59	4.004	3.153	2.761	2.528	2.371	2.257	2.169	2.100	2.043	1.995
60	4.001	3.150	2.758	2.525	2.368	2.254	2.167	2.097	2.040	1.993
61	3.998	3.148	2.755	2.523	2.366	2.251	2.164	2.094	2.037	1.990
62	3.996	3.145	2.753	2.520	2.363	2.249	2.161	2.092	2.035	1.987
63	3.993	3.143	2.751	2.518	2.361	2.246	2.159	2.089	2.032	1.985
64	3.991	3.140	2.748	2.515	2.358	2.244	2.156	2.087	2.030	1.982
65	3.989	3.138	2.746	2.513	2.356	2.242	2.154	2.084	2.027	1.980
66	3.986	3.136	2.744	2.511	2.354	2.239	2.152	2.082	2.025	1.977
67	3.984	3.134	2.742	2.509	2.352	2.237	2.150	2.080	2.023	1.975
68	3.982	3.132	2.740	2.507	2.350	2.235	2.148	2.078	2.021	1.973
69	3.980	3.130	2.737	2.505	2.348	2.233	2.145	2.076	2.019	1.971
70	3.978	3.128	2.736	2.503	2.346	2.231	2.143	2.074	2.017	1.969
71	3.976	3.126	2.734	2.501	2.344	2.229	2.142	2.072	2.015	1.967
72	3.974	3.124	2.732	2.499	2.342	2.227	2.140	2.070	2.013	1.965
73	3.972	3.122	2.730	2.497	2.340	2.226	2.138	2.068	2.011	1.963
74	3.970	3.120	2.728	2.495	2.338	2.224	2.136	2.066	2.009	1.961
75	3.968	3.119	2.727	2.494	2.337	2.222	2.134	2.064	2.007	1.959
76	3.967	3.117	2.725	2.492	2.335	2.220	2.133	2.063	2.006	1.958
77	3.965	3.115	2.723	2.490	2.333	2.219	2.131	2.061	2.004	1.956
78	3.963	3.114	2.722	2.489	2.332	2.217	2.129	2.059	2.002	1.954
79	3.962	3.112	2.720	2.487	2.330	2.216	2.128	2.058	2.001	1.953
80	3.960	3.111	2.719	2.486	2.329	2.214	2.126	2.056	1.999	1.951
81	3.959	3.109	2.717	2.484	2.327	2.213	2.125	2.055	1.998	1.950
82	3.957	3.108	2.716	2.483	2.326	2.211	2.123	2.053	1.996	1.948
83	3.956	3.107	2.715	2.482	2.324	2.210	2.122	2.052	1.995	1.947
84	3.955	3.105	2.713	2.480	2.323	2.209	2.121	2.051	1.993	1.945
85	3.953	3.104	2.712	2.479	2.322	2.207	2.119	2.049	1.992	1.944
86	3.952	3.103	2.711	2.478	2.321	2.206	2.118	2.048	1.991	1.943
87	3.951	3.101	2.709	2.476	2.319	2.205	2.117	2.047	1.989	1.941
88	3.949	3.100	2.708	2.475	2.318	2.203	2.115	2.045	1.988	1.940
89	3.948	3.099	2.707	2.474	2.317	2.202	2.114	2.044	1.987	1.939
90	3.947	3.098	2.706	2.473	2.316	2.201	2.113	2.043	1.986	1.938
91	3.946	3.097	2.705	2.472	2.315	2.200	2.112	2.042	1.984	1.936
92	3.945	3.095	2.704	2.471	2.313	2.199	2.111	2.041	1.983	1.935
93	3.943	3.094	2.703	2.470	2.312	2.198	2.110	2.040	1.982	1.934
94	3.942	3.093	2.701	2.469	2.311	2.197	2.109	2.038	1.981	1.933
95	3.941	3.092	2.700	2.467	2.310	2.196	2.108	2.037	1.980	1.932
96	3.940	3.091	2.699	2.466	2.309	2.195	2.106	2.036	1.979	1.931
97	3.939	3.090	2.698	2.465	2.308	2.194	2.105	2.035	1.978	1.930
98	3.938	3.089	2.697	2.465	2.307	2.193	2.104	2.034	1.977	1.929
99	3.937	3.088	2.696	2.464	2.306	2.192	2.103	2.033	1.976	1.928
100	3.936	3.087	2.696	2.463	2.305	2.191	2.103	2.032	1.975	1.927

library

00114



Faculty of Management and Social Sciences  
Department of Logistics & Transport  
BSc Hons in Logistics and Transportation  
COURSE CODE: COM 551



Year 3 Semester II

SEMESTER END EXAMINATION

Econometrics – LTEC3211

- This paper consists of SEVEN questions on FIVE (05) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.
- Formulae sheet and required tables are attached.

Date: 2023.03.20

Pass mark: 50%

Time: 02 Hours

### Question 01 (Compulsory)

“Econometrics consists of economic measurements and lends empirical supports to the models constructed in mathematical economics”

- (a). Briefly describe this statement. (05 Marks)
- (b). Define theoretical and applied econometrics with example. (08 Marks)
- (c). Describe the types of data and analytical techniques. (12 Marks)

### Question 02

- (a). Explain the “Estimate” and “Estimator”. (06 Marks)
- (b). Describe the “Law of Statistical Regularity” and “Law of Inertia”. (06 Marks)

- (c). What is meant by "Central Limit Theorem"? (06 Marks)
- (d). What are the attributes of Normal distribution? (07 Marks)

### Question 03

- (a). A sample size of 200 has 45.6 and 3.2 mean and standard deviation respectively. Calculate standard error and margin of error at 95% level of confidence. (06 Marks)
- (b). You have been appointed to estimate the average weight of a product at 95% level of confidence. When a sample size of 100 is analysed, the average weight of a product is 30.5 kg with a standard deviation of 6.3 kg. Estimate the average weight of the product at 95% confidence. (07 Marks)
- (c). There are two companies which produce same products in two brands. It is expected to estimate the difference of the life time between the two brands. Selecting 10 items from each brand, life time has been calculated and information is provided below. Estimate the difference of the life time between the two brands.

Brand 1 (Years)	4	4	4	3	3	4	3	3	3	4
Brand 2 (Years)	4	3	3	4	3	3	4	3	4	3

(12 Marks)

### Question 04

- (a). Describe the "Null" and " Alternative" hypotheses. (04 Marks)
- (b). What are the types of errors in hypothesis tests? (04 Marks)
- (c). The management of a company says that the weight of a product is 50kg in average. You have been appointed to test the statement of the management. Selecting eight items, weight has been measured and information is



provided by the following table. Test the statement at 5% level of significance.

Weight in kg	52	49	49	46	47	51	49	51
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(08 Marks)

- (d) The management of two companies say that there is not a difference between two products in relation to weight. Selecting 10 items from each company, weight has been calculated and information is provided below. Test the management statement at 5% level of significance.

Company 1 (Kg)	32	34	33	29	26	33	27	29	27	31
Company 2 (Kg)	32	28	28	32	29	27	33	28	32	26

(09 Marks)

### Question 05

- (a) What is the purpose of one way Analysis of Variance (ANOVA)?  
(05 Marks)
- (b) Three companies produce same product in three brands. They say that there is no difference in the life time of the products due to the companies. Selecting five items from each company, life time of the products has been estimated in years and the result is given in the following table. Test whether there is a significant difference between the three brands.

Company 1	Company 2	Company 3
19	17	19
15	16	19
18	22	20
17	23	19
21	22	18

(20 Marks)

**Question 06**

Following table provides information on price of a product and demand of a product in five districts.

Districts	Price	Demand
1	07	40
2	06	50
3	09	30
4	05	60
5	04	70

- (a) Calculate the coefficient of correlation between price and demand and interpret the results. (06 Marks)
- (b) Construct a Simple Regression Model to study the effect of the price on demand. (06 Marks)
- (c) What will be the demand if the price is Rs.3? (04 Marks)
- (d) Construct the regression ANOVA table and interpret the results (09 Marks)

**Question 07**

- (a). What is the meaning of non-stationary data and how you can use them to construct models to analyse data. (05 Marks)
- (a). You need to test stationary of Public Debt (PD) with drift and trend. Write a model for the Augmented Dickey Fuller (ADF) unit root test. (09 Marks)

- (c). It is expected to test whether Debt (D) granger causes Gross Domestic Production (GDP) in Sri Lanka. Two regression models have been constructed for 100 periods. Restricted and unrestricted models and Residual Sum of Square (RSS) are respectively provided for the models below. Take the decision using granger causality.

$$GDP_t = \beta_0 + \beta_1 GDP(-1)_t + u_t \quad RSS = 275.04$$

$$GDP_t = \beta_0 + \beta_1 GDP(-1)_t + \beta_2 D(-1)_t + u_t \quad RSS = 165.34$$

(11 Marks)

-----END OF THE QUESTION PAPER-----

## Formula sheet

$$\text{Mean} = \frac{\sum x}{n}$$

$$\text{Variance} = \frac{\sum (x - \bar{x})^2}{n-1}$$

$$(\bar{x}_1 - \bar{x}_2) \pm z_{\frac{\alpha}{2}} SE$$

$$SE = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$SE = SP \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

$$SP = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

$$TS = \frac{\bar{x} - \mu_0}{\frac{\sigma}{\sqrt{n}}}$$

$$TS = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$TS = \frac{\bar{x}_1 - \bar{x}_2}{SP \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$\text{Granger Causality (F)} = \frac{(RSS_R - RSS_{UR})/M}{RSS_{UR}/(N - K)}$$

*Coefficient of Correlation*

$$= \frac{n \sum xy - \sum x \sum y}{\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}}$$

## Normal Equations

$$Y = a + bx$$

$$\sum y = na + b \sum x$$

$$\sum xy = a \sum x + b \sum x^2$$

$$\text{Sum of Square of Regression} = \sum (\hat{Y} - \bar{Y})^2$$

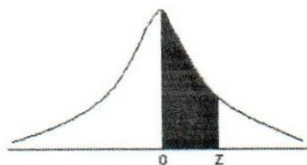
$$\text{Sum of Square of Residual} = \sum (Y - \hat{Y})^2$$

$$\text{Sum of Square of Total} = \sum (Y - \bar{Y})^2$$

$$\text{Sum of Square of Variance between groups} = \sum (\bar{X} - \bar{\bar{X}})^2$$

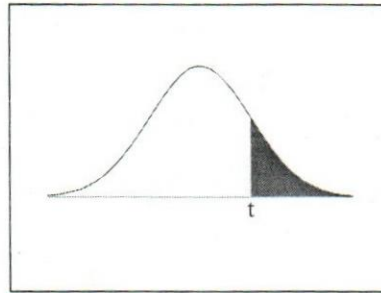
$$\text{Sum of Square of variance within groups} = \sum (X - \bar{X})^2$$

$$\text{Sum of Square of Total variance} = \sum (X - \bar{\bar{X}})^2$$



Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.49865	0.49869	0.49874	0.49878	0.49882	0.49886	0.49889	0.49893	0.49896	0.49900
3.1	0.49903	0.49906	0.49910	0.49913	0.49916	0.49918	0.49921	0.49924	0.49926	0.49929
3.2	0.49931	0.49934	0.49936	0.49938	0.49940	0.49942	0.49944	0.49946	0.49948	0.49950
3.3	0.49952	0.49953	0.49955	0.49957	0.49958	0.49960	0.49961	0.49962	0.49964	0.49965
3.4	0.49966	0.49968	0.49969	0.49970	0.49971	0.49972	0.49973	0.49974	0.49975	0.49976
3.5	0.49977	0.49978	0.49978	0.49979	0.49980	0.49981	0.49981	0.49982	0.49983	0.49983

## t-Distribution Table



The shaded area is equal to  $\alpha$  for  $t = t_{\alpha}$ .

$df$	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
32	1.309	1.694	2.037	2.449	2.738
34	1.307	1.691	2.032	2.441	2.728
36	1.306	1.688	2.028	2.434	2.719
38	1.304	1.686	2.024	2.429	2.712
$\infty$	1.282	1.645	1.960	2.326	2.576

CRITICAL VALUES for the "F" Distribution, ALPHA = .05.

00114

Denominator DF	Numerator DF									
	1	2	3	4	5	6	7	8	9	10
1	161.448	199.500	215.707	224.583	230.162	233.986	236.768	238.883	240.543	241.882
2	18.513	19.000	19.164	19.247	19.296	19.330	19.353	19.371	19.385	19.396
3	10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845	8.812	8.786
4	7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041	5.999	5.964
5	6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818	4.772	4.735
6	5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147	4.099	4.060
7	5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726	3.677	3.637
8	5.318	4.459	4.066	3.838	3.687	3.581	3.500	3.438	3.388	3.347
9	5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230	3.179	3.137
10	4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072	3.020	2.978
11	4.844	3.982	3.587	3.357	3.204	3.095	3.012	2.948	2.896	2.854
12	4.747	3.885	3.490	3.259	3.106	2.996	2.913	2.849	2.796	2.753
13	4.667	3.806	3.411	3.179	3.025	2.915	2.832	2.767	2.714	2.671
14	4.600	3.739	3.344	3.112	2.958	2.848	2.764	2.699	2.646	2.602
15	4.543	3.682	3.287	3.056	2.901	2.790	2.707	2.641	2.588	2.544
16	4.494	3.634	3.239	3.007	2.852	2.741	2.657	2.591	2.538	2.494
17	4.451	3.592	3.197	2.965	2.810	2.699	2.614	2.548	2.494	2.450
18	4.414	3.555	3.160	2.928	2.773	2.661	2.577	2.510	2.456	2.412
19	4.381	3.522	3.127	2.895	2.740	2.628	2.544	2.477	2.423	2.378
20	4.351	3.493	3.098	2.866	2.711	2.599	2.514	2.447	2.393	2.348
21	4.325	3.467	3.072	2.840	2.685	2.573	2.488	2.420	2.366	2.321
22	4.301	3.443	3.049	2.817	2.661	2.549	2.464	2.397	2.342	2.297
23	4.279	3.422	3.028	2.796	2.640	2.528	2.442	2.375	2.320	2.275
24	4.260	3.403	3.009	2.776	2.621	2.508	2.423	2.355	2.300	2.255
25	4.242	3.385	2.991	2.759	2.603	2.490	2.405	2.337	2.282	2.236
26	4.225	3.369	2.975	2.743	2.587	2.474	2.388	2.321	2.265	2.220
27	4.210	3.354	2.960	2.728	2.572	2.459	2.373	2.305	2.250	2.204
28	4.196	3.340	2.947	2.714	2.558	2.445	2.359	2.291	2.236	2.190
29	4.183	3.328	2.934	2.701	2.545	2.432	2.346	2.278	2.223	2.177
30	4.171	3.316	2.922	2.690	2.534	2.421	2.334	2.266	2.211	2.165
31	4.160	3.305	2.911	2.679	2.523	2.409	2.323	2.255	2.199	2.153
32	4.149	3.295	2.901	2.668	2.512	2.399	2.313	2.244	2.189	2.142
33	4.139	3.285	2.892	2.659	2.503	2.389	2.303	2.235	2.179	2.133
34	4.130	3.276	2.883	2.650	2.494	2.380	2.294	2.225	2.170	2.123
35	4.121	3.267	2.874	2.641	2.485	2.372	2.285	2.217	2.161	2.114
36	4.113	3.259	2.866	2.634	2.477	2.364	2.277	2.209	2.153	2.106
37	4.105	3.252	2.859	2.626	2.470	2.356	2.270	2.201	2.145	2.098
38	4.098	3.245	2.852	2.619	2.463	2.349	2.262	2.194	2.138	2.091
39	4.091	3.238	2.845	2.612	2.456	2.342	2.255	2.187	2.131	2.084
40	4.085	3.232	2.839	2.606	2.449	2.336	2.249	2.180	2.124	2.077
41	4.079	3.226	2.833	2.600	2.443	2.330	2.243	2.174	2.118	2.071
42	4.073	3.220	2.827	2.594	2.438	2.324	2.237	2.168	2.112	2.065
43	4.067	3.214	2.822	2.589	2.432	2.318	2.232	2.163	2.106	2.059
44	4.062	3.209	2.816	2.584	2.427	2.313	2.226	2.157	2.101	2.054
45	4.057	3.204	2.812	2.579	2.422	2.308	2.221	2.152	2.096	2.049
46	4.052	3.200	2.807	2.574	2.417	2.304	2.216	2.147	2.091	2.044
47	4.047	3.195	2.802	2.570	2.413	2.299	2.212	2.143	2.086	2.039
48	4.043	3.191	2.798	2.565	2.409	2.295	2.207	2.138	2.082	2.035
49	4.038	3.187	2.794	2.561	2.404	2.290	2.203	2.134	2.077	2.030
50	4.034	3.183	2.790	2.557	2.400	2.286	2.199	2.130	2.073	2.026



**CRITICAL VALUES for the "F" Distribution, ALPHA = .05.**

00114

Denominator DF	Numerator DF									
	1	2	3	4	5	6	7	8	9	10
51	4.030	3.179	2.786	2.553	2.397	2.283	2.195	2.126	2.069	2.022
52	4.027	3.175	2.783	2.550	2.393	2.279	2.192	2.122	2.066	2.018
53	4.023	3.172	2.779	2.546	2.389	2.275	2.188	2.119	2.062	2.015
54	4.020	3.168	2.776	2.543	2.386	2.272	2.185	2.115	2.059	2.011
55	4.016	3.165	2.773	2.540	2.383	2.269	2.181	2.112	2.055	2.008
56	4.013	3.162	2.769	2.537	2.380	2.266	2.178	2.109	2.052	2.005
57	4.010	3.159	2.766	2.534	2.377	2.263	2.175	2.106	2.049	2.001
58	4.007	3.156	2.764	2.531	2.374	2.260	2.172	2.103	2.046	1.998
59	4.004	3.153	2.761	2.528	2.371	2.257	2.169	2.100	2.043	1.995
60	4.001	3.150	2.758	2.525	2.368	2.254	2.167	2.097	2.040	1.993
61	3.998	3.148	2.755	2.523	2.366	2.251	2.164	2.094	2.037	1.990
62	3.996	3.145	2.753	2.520	2.363	2.249	2.161	2.092	2.035	1.987
63	3.993	3.143	2.751	2.518	2.361	2.246	2.159	2.089	2.032	1.985
64	3.991	3.140	2.748	2.515	2.358	2.244	2.156	2.087	2.030	1.982
65	3.989	3.138	2.746	2.513	2.356	2.242	2.154	2.084	2.027	1.980
66	3.986	3.136	2.744	2.511	2.354	2.239	2.152	2.082	2.025	1.977
67	3.984	3.134	2.742	2.509	2.352	2.237	2.150	2.080	2.023	1.975
68	3.982	3.132	2.740	2.507	2.350	2.235	2.148	2.078	2.021	1.973
69	3.980	3.130	2.737	2.505	2.348	2.233	2.145	2.076	2.019	1.971
70	3.978	3.128	2.736	2.503	2.346	2.231	2.143	2.074	2.017	1.969
71	3.976	3.126	2.734	2.501	2.344	2.229	2.142	2.072	2.015	1.967
72	3.974	3.124	2.732	2.499	2.342	2.227	2.140	2.070	2.013	1.965
73	3.972	3.122	2.730	2.497	2.340	2.226	2.138	2.068	2.011	1.963
74	3.970	3.120	2.728	2.495	2.338	2.224	2.136	2.066	2.009	1.961
75	3.968	3.119	2.727	2.494	2.337	2.222	2.134	2.064	2.007	1.959
76	3.967	3.117	2.725	2.492	2.335	2.220	2.133	2.063	2.006	1.958
77	3.965	3.115	2.723	2.490	2.333	2.219	2.131	2.061	2.004	1.956
78	3.963	3.114	2.722	2.489	2.332	2.217	2.129	2.059	2.002	1.954
79	3.962	3.112	2.720	2.487	2.330	2.216	2.128	2.058	2.001	1.953
80	3.960	3.111	2.719	2.486	2.329	2.214	2.126	2.056	1.999	1.951
81	3.959	3.109	2.717	2.484	2.327	2.213	2.125	2.055	1.998	1.950
82	3.957	3.108	2.716	2.483	2.326	2.211	2.123	2.053	1.996	1.948
83	3.956	3.107	2.715	2.482	2.324	2.210	2.122	2.052	1.995	1.947
84	3.955	3.105	2.713	2.480	2.323	2.209	2.121	2.051	1.993	1.945
85	3.953	3.104	2.712	2.479	2.322	2.207	2.119	2.049	1.992	1.944
86	3.952	3.103	2.711	2.478	2.321	2.206	2.118	2.048	1.991	1.943
87	3.951	3.101	2.709	2.476	2.319	2.205	2.117	2.047	1.989	1.941
88	3.949	3.100	2.708	2.475	2.318	2.203	2.115	2.045	1.988	1.940
89	3.948	3.099	2.707	2.474	2.317	2.202	2.114	2.044	1.987	1.939
90	3.947	3.098	2.706	2.473	2.316	2.201	2.113	2.043	1.986	1.938
91	3.946	3.097	2.705	2.472	2.315	2.200	2.112	2.042	1.984	1.936
92	3.945	3.095	2.704	2.471	2.313	2.199	2.111	2.041	1.983	1.935
93	3.943	3.094	2.703	2.470	2.312	2.198	2.110	2.040	1.982	1.934
94	3.942	3.093	2.701	2.469	2.311	2.197	2.109	2.038	1.981	1.933
95	3.941	3.092	2.700	2.467	2.310	2.196	2.108	2.037	1.980	1.932
96	3.940	3.091	2.699	2.466	2.309	2.195	2.106	2.036	1.979	1.931
97	3.939	3.090	2.698	2.465	2.308	2.194	2.105	2.035	1.978	1.930
98	3.938	3.089	2.697	2.465	2.307	2.193	2.104	2.034	1.977	1.929
99	3.937	3.088	2.696	2.464	2.306	2.192	2.103	2.033	1.976	1.928
100	3.936	3.087	2.696	2.463	2.305	2.191	2.103	2.032	1.975	1.927



Faculty of Management and Social Sciences  
Department of Logistics & Transport  
BSc Hons in Logistics and Transportation  
COURSE CODE: COM 551



Year 3 Semester II  
SEMESTER END EXAMINATION  
Project Management – LTPM3209

- This paper consists of SEVEN questions on SEVEN (07) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.03.16

Pass mark: 50%

Time: 02 Hours

**Question 01: (Compulsory)**

An academic society of the University is organizing an invitational Cricket Tournament in the university community to raise funds for their charity projects. The academic society plans to hold the tournament in the 1<sup>st</sup> weekend of April 2023. The society already has a budget of Rs. 300,000 allocated for this project. The aim is to hold a tournament for 10 cricket teams with a match draft developed by the team. They conducted a brainstorming session to identify the major activities of the tournament organizing. The major activities identified during the brainstorming session were Team registrations, Promotions and advertisement collection, Food and beverage arrangements, Tournament drafting and administrative activities planning, Ground and referee organizing, Prize and tokens of appreciation arrangements. The society president was elected to steer the project team where a group of 15 members from the society were selected as the project team. With the limited time they have, the team decided to plan the project to avoid any mistakes and they aim to use the project management tools they have learnt in this endeavor.

- (a) Develop a suitable objective for the project mentioned above. (*Hint: Use SMART criterion*) (03 Marks)
- (b) Based on the information given, developed a Work Breakdown Structure (WBS) with no more than 3 levels. (*Hint: Addition of any appropriate sub-deliverables is allowed.*)

- (c) Other than the WBS, what other project management tools can the project team use to increase the accuracy of their planning? (08 Marks)
- (d) How many communication channels at most would the society president as the project manager have during this project? (*Hint: Assume all members of the project team are assigned unique work*) (03 Marks)
- (e) Name 2 internal and 2 external environmental factors that could create uncertainty in the project planning. (03 Marks)
- (f) Name 2 factors the project team can use in determining the success of the project. (04 Marks)
- (04 Marks)

### Question 02

- (a) Organizational strategy provides a direction for the overall organization and its conduct. Project management as a supplementary management field that aids in the strategy implementation of the organization through projects.
- (i) What are the basic reasons for a project manager to understand strategy? (02 Marks)
- (ii) How do the 3Ps of project management they differ from one another? (06 Marks)
- (iii) Name 2 importance of project prioritization for an organization. (04 Marks)
- (iv) Name 3 basic classifications of projects based on their strategic intention, undertaken in an organization. (03 Marks)
- (b) An organization has its own structure and nurture a culture. No two organizations in the same field of operations would be like one another in this aspect.
- (i) FXS is a company with a strong organizational culture and a functional structure. With a strategic direction change, the top management needs to implement a project organization-wide. What factors should the top management of FXS consider in terms of organizational structure and culture? (04 Marks)
- (ii) ABX is a company trying to develop a zero-waste organizational environment. The top management wants to add a dedicated project team in their organizational structure to implement the zero-waste project organization-wide. What are the pros and cons of this decision? (06 Marks)

### Question 03

- (a) Project management practiced on a global scale uses a few tools in project planning and execution of activities. Among them Work Breakdown Structure, Network diagrams, project budget and Gantt charts are commonly used on a global scale.
- (i) Name 2 similarities and 2 dissimilarities in Network diagrams and WBS. (04 Marks)
- (ii) What factors would affect the accuracy of the WBS and network diagram development. (02 Marks)
- (b) Given below is the information on a new product development undertaken by the Sam & Sons Furniture Manufacturers. Their new product development and prototype testing is for a new chair design. The company developed the activity analysis through a WBS, and the Table 3.00 indicates the sequential flow of activities and their durations.
- (i) Develop a network diagram for the new chair design and testing project. (05 Marks)
- (ii) Calculate the time duration of the project. (08 Marks)
- (iii) If the activity E gets delayed by 15 days due to unforeseen circumstances, would there be any changes to the project duration? (03 Marks)
- (iv) How many free float days are available for activity K? (03 Marks)

**Table 3.00: Activity durations of a furniture design**

Activity ID	Predecessor	Duration (Days)
A	-	4
B	-	5
C	-	6
D	A	8
E	A, B	3
F	C	7
G	F	8
H	D	11
I	H	9
J	H	4
K	E, F	4
M	G, I, J, K	6

**Question 04**

(a) Projects are inherent with an uncertainty caused by both internal and external environmental factors.

(i) Name 2 risk assessment methods that could be used in analysing the severity of an inherent risk.

(02 Marks)

(ii) Name the responses that could be used in managing positive risks.

(04 Marks)

(b) ABC is a construction company with a project orientation in their work environment. They undertake different types of construction projects ranging from building and house constructions to road and infrastructure constructions.

(i) Develop the network diagram for the activities on the construction project listed in Table 03

(03 Marks)

(ii) Find the mean and the variance values of each activity.

(04 Marks)

(iii) The project offers a bonus of Rs. 100,000 for completing the project in the scheduled time of 12 months. Will the company receive the bonus? What is the probability of NOT receiving the bonus?

(09 Marks)

(iv) What should be the scheduled duration for the project to be complete in 95.15% confidence.

(03 Marks)

**Table 4.00: Time durations of activities**

Activity ID	Predecessor	Time Durations (months)		
		Optimistic	Most likely	Pessimistic
A	-	2	3	4
B	-	5	6	7
C	-	3	4	5
D	A	1	4	7
E	C	3	5	7
F	A	3	4	5
G	B, D, E	1	2	3

**Question 05**

A seasonal food manufacturer is planning to develop a new food product for the Sinhalese and Tamil New year 2023. The food manufacturer has decided to develop a savoury food item for the season. He identified the best time frame for the product introduction was from the beginning of April 2023. He plans to develop a risk assessment analysis for the product development project. He has already identified economic, technical, socio-cultural, technological, legal, political and project management risks are inherent in the project.

- (a) Based on the information above, identify any 5 inherent risks in this project  
(*Hint: If needed, a risk classification of your choice can be used*).  
(05 Marks)
- (b) Use the scenario analysis technique and develop a risk assessment matrix for the risks identified above providing appropriate justification.  
(10 Marks)
- (c) State a risk response and a contingency plan for each of the risks identified.  
(10Marks)

### Question 06

- (a) Project planning and execution relies on different resources, skills, tools, and techniques.
- (i) What factors influence a time or a cost estimate?  
(04 Marks)
- (ii) A company undertaking similar types of projects. When estimating project costs, they simply rely on the former project they did. They estimate the total cost for the new projects based on the total cost of the older projects. What is the estimation method used by this company? Justify your answer.  
(04 Marks)
- (b) The information on a system development project is give in Table 6.00 and the following figure. BXS is a system development company seeking to reduce costs of the given project through project crashing. The project has a direct cost of \$9700 and an indirect cost of \$200 per day.
- (i) Identify the critical path of the project.  
(02 Marks)
- (ii) Based on the information given and using the least cost assumptions, identify the optimal crash time of the project.  
(06 Marks)
- (iii) Calculate the direct, indirect, and total cost for the optimal crash time.  
(09 Marks)

**Table 6.00: Project crash times and costs**

ID	Direct Costs		Slope (\$/day)	Maximum Crash Time
	Normal			
	Time (Days)	Cost (\$)		
A	5	500	100	1
B	10	1200	200	4
C	13	3600	600	2
D	13	300	150	2
E	5	1000	400	1
F	10	2400	1500	2

G	5	700	0	0
Project cost		9700		

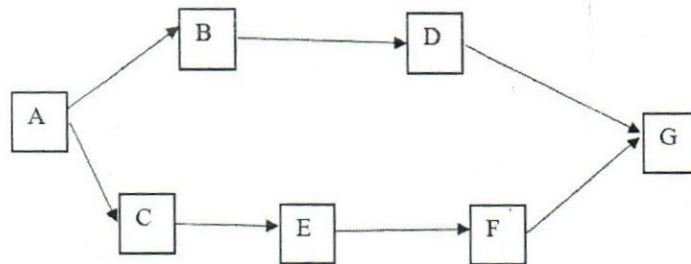


Figure 6.00: Network Diagram

### Question 07

- (a) Briefly explain 2 factors that are important other than the required skill levels when developing teams? (05 Marks)
- (b) "Risk management in project management is a proactive process". Do you agree with the statement? Justify your answer. (05 Marks)
- (c) Briefly explain why a project closure should be closely planned and executed. (05 Marks)
- (d) What do you mean by 'scope creep'? How does it lead to project failure? (05 Marks)
- (e) Briefly explain 2 reasons to refine time/ cost estimates of a project. (05 Marks)

-----END OF THE QUESTION PAPER-----

**Attachments**

$$1. \quad t_e = \frac{a+4m+b}{6}$$

$$\sigma_{t_e}^2 = \left(\frac{b-a}{6}\right)^2$$

$$Z = \frac{T_s - T_E}{\sqrt{\sum \sigma_{t_e}^2}}$$

$t_e$  - expected time

$\sigma_{t_e}^2$  - Variance of the time

Z - Probability (of meeting scheduled duration) found in statistical Table

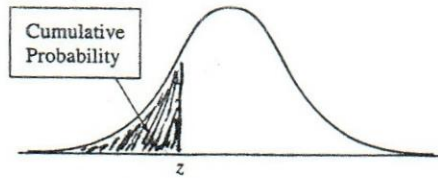
$T_s$  - Scheduled project duration

$T_E$  - Critical path duration

2. Standard normal tables (Attached to the email)



# APPENDIX A

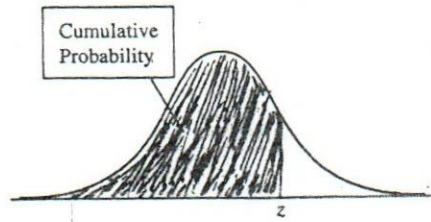


Cumulative probability for  $z$  is the area under the standard normal curve to the left of  $z$

**TABLE A Standard Normal Cumulative Probabilities**

$z$	.00
-5.0	.000000287
-4.5	.00000340
-4.0	.0000317
-3.5	.000233

$z$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
-3.4	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0003	.0002
-3.3	.0005	.0005	.0005	.0004	.0004	.0004	.0004	.0004	.0004	.0003
-3.2	.0007	.0007	.0006	.0006	.0006	.0006	.0006	.0005	.0005	.0005
-3.1	.0010	.0009	.0009	.0009	.0008	.0008	.0008	.0008	.0007	.0007
-3.0	.0013	.0013	.0013	.0012	.0012	.0011	.0011	.0011	.0010	.0010
-2.9	.0019	.0018	.0018	.0017	.0016	.0016	.0015	.0015	.0014	.0014
-2.8	.0026	.0025	.0024	.0023	.0023	.0022	.0021	.0021	.0020	.0019
-2.7	.0035	.0034	.0033	.0032	.0031	.0030	.0029	.0028	.0027	.0026
-2.6	.0047	.0045	.0044	.0043	.0041	.0040	.0039	.0038	.0037	.0036
-2.5	.0062	.0060	.0059	.0057	.0055	.0054	.0052	.0051	.0049	.0048
-2.4	.0082	.0080	.0078	.0075	.0073	.0071	.0069	.0068	.0066	.0064
-2.3	.0107	.0104	.0102	.0099	.0096	.0094	.0091	.0089	.0087	.0084
-2.2	.0139	.0136	.0132	.0129	.0125	.0122	.0119	.0116	.0113	.0110
-2.1	.0179	.0174	.0170	.0166	.0162	.0158	.0154	.0150	.0146	.0143
-2.0	.0228	.0222	.0217	.0212	.0207	.0202	.0197	.0192	.0188	.0183
-1.9	.0287	.0281	.0274	.0268	.0262	.0256	.0250	.0244	.0239	.0233
-1.8	.0359	.0351	.0344	.0336	.0329	.0322	.0314	.0307	.0301	.0294
-1.7	.0446	.0436	.0427	.0418	.0409	.0401	.0392	.0384	.0375	.0367
-1.6	.0548	.0537	.0526	.0516	.0505	.0495	.0485	.0475	.0465	.0455
-1.5	.0668	.0655	.0643	.0630	.0618	.0606	.0594	.0582	.0571	.0559
-1.4	.0808	.0793	.0778	.0764	.0749	.0735	.0721	.0708	.0694	.0681
-1.3	.0968	.0951	.0934	.0918	.0901	.0885	.0869	.0853	.0838	.0823
-1.2	.1151	.1131	.1112	.1093	.1075	.1056	.1038	.1020	.1003	.0985
-1.1	.1357	.1335	.1314	.1292	.1271	.1251	.1230	.1210	.1190	.1170
-1.0	.1587	.1562	.1539	.1515	.1492	.1469	.1446	.1423	.1401	.1379
-0.9	.1841	.1814	.1788	.1762	.1736	.1711	.1685	.1660	.1635	.1611
-0.8	.2119	.2090	.2061	.2033	.2005	.1977	.1949	.1922	.1894	.1867
-0.7	.2420	.2389	.2358	.2327	.2296	.2266	.2236	.2206	.2177	.2148
-0.6	.2743	.2709	.2676	.2643	.2611	.2578	.2546	.2514	.2483	.2451
-0.5	.3085	.3050	.3015	.2981	.2946	.2912	.2877	.2843	.2810	.2776
-0.4	.3446	.3409	.3372	.3336	.3300	.3264	.3228	.3192	.3156	.3121
-0.3	.3821	.3783	.3745	.3707	.3669	.3632	.3594	.3557	.3520	.3483
-0.2	.4207	.4168	.4129	.4090	.4052	.4013	.3974	.3936	.3897	.3859
-0.1	.4602	.4562	.4522	.4483	.4443	.4404	.4364	.4325	.4286	.4247
-0.0	.5000	.4960	.4920	.4880	.4840	.4801	.4761	.4721	.4681	.4641



Cumulative probability for  $z$  is the area under the standard normal curve to the left of  $z$

**TABLE A Standard Normal Cumulative Probabilities (continued)**

$z$	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133
0.9	.8159	.8186	.8212	.8238	.8264	.8289	.8315	.8340	.8365	.8389
1.0	.8413	.8438	.8461	.8485	.8508	.8531	.8554	.8577	.8599	.8621
1.1	.8643	.8665	.8686	.8708	.8729	.8749	.8770	.8790	.8810	.8830
1.2	.8849	.8869	.8888	.8907	.8925	.8944	.8962	.8980	.8997	.9015
1.3	.9032	.9049	.9066	.9082	.9099	.9115	.9131	.9147	.9162	.9177
1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706
1.9	.9713	.9719	.9726	.9732	.9738	.9744	.9750	.9756	.9761	.9767
2.0	.9772	.9778	.9783	.9788	.9793	.9798	.9803	.9808	.9812	.9817
2.1	.9821	.9826	.9830	.9834	.9838	.9842	.9846	.9850	.9854	.9857
2.2	.9861	.9864	.9868	.9871	.9875	.9878	.9881	.9884	.9887	.9890
2.3	.9893	.9896	.9898	.9901	.9904	.9906	.9909	.9911	.9913	.9916
2.4	.9918	.9920	.9922	.9925	.9927	.9929	.9931	.9932	.9934	.9936
2.5	.9938	.9940	.9941	.9943	.9945	.9946	.9948	.9949	.9951	.9952
2.6	.9953	.9955	.9956	.9957	.9959	.9960	.9961	.9962	.9963	.9964
2.7	.9965	.9966	.9967	.9968	.9969	.9970	.9971	.9972	.9973	.9974
2.8	.9974	.9975	.9976	.9977	.9977	.9978	.9979	.9979	.9980	.9981
2.9	.9981	.9982	.9982	.9983	.9984	.9984	.9985	.9985	.9986	.9986
3.0	.9987	.9987	.9987	.9988	.9988	.9989	.9989	.9989	.9990	.9990
3.1	.9990	.9991	.9991	.9991	.9992	.9992	.9992	.9992	.9993	.9993
3.2	.9993	.9993	.9994	.9994	.9994	.9994	.9994	.9995	.9995	.9995
3.3	.9995	.9995	.9995	.9996	.9996	.9996	.9996	.9996	.9996	.9997
3.4	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9997	.9998

$z$	.00
3.5	.999767
4.0	.9999683
4.5	.9999966
5.0	.99999713

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**Year 3 Semester II**  
**SEMESTER END EXAMINATION**  
**Airport Planning and Management – LTAM3210**

- This paper consists of SEVEN questions on THREE (03) pages.
- Answer SEVEN (07) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.03.14

Pass mark: 50%

Time: 02 Hours

**Question 01: (Compulsory)**

- (a) Write down the definition of Flight Information Region (FIR) and list down 3(three) neighboring FIRs to the Colombo FIR. (04 Marks)
- (b) Briefly explain the 3(three) types of Air traffic control (ATC) services provided by Airport and Aviation Services Sri Lanka (AASL). (09 Marks)
- (c) 'Every airport has four "publics" with which it interacts despite the difference in size and scope of activities of airports.' Explain with examples. (12 Marks)

**Question 02**

- (a) Airports play different roles in shaping the economic, political, and environmental aspects of the communities they serve. Explain in detail the economic role played by an airport operating at its maximum capacity. (12 Marks)
- (b) Airports and airlines have formalized their relationship through "Airport Service Level Agreements (SLA)" Explain the objectives and elements of an airport service level agreement. (13 Marks)

**Question 03**

- (a) Differentiate between aeronautical charges and non-aeronautical charges with examples. (06 Marks)
- (b) Financing of large scale airport projects is always a concern for airport owners and operators due to the large amounts of capital required. Explain different sources of financing available for developing airport infrastructure. (10 Marks)
- (c) Duration between the desired time that an operation occurs and the actual time the operation occurs is defined as delay. Explain strategies that can be used by the airport management to reduce delays. (09 Marks)

**Question 04**

- (a) Airport terminal configurations play an important role in airport management and operations and have evolved to accommodate the ever-growing air transport industry. Explain the evolution of airport terminal configurations by comparing different terminal configurations. (25 Marks)

**Question 05**

- (a) Briefly explain the difference between Visual Flight Rules (VFR) and Instrument Flight Rules (IFR). (06 Marks)
- (b) Runway configuration refers to the relative orientations of one or more runways on an airfield. There are different runway configurations at different airports. Explain how each basic runway configuration affects capacity and delay of an airport? (10 Marks)
- (c) Explain any 3(three) types of signs installed on airfields to provide more precise and accurate information for pilots to navigate the aircraft in the airfield. (09 Marks)

**Question 06**

- (a) Briefly explain the importance of prevention of foreign object debris (FOD) at airports and FOD prevention methods. (10 Marks)

- (b) The aviation sector is growing fast and will continue to grow. Airport management is responsible to make airports safer, more convenient, and more efficient to ensure the airports can be successful in future. Explain strategies that airports must utilize to be successful and survive in the future. (15 Marks)

### Question 07

- (a) What is meant by an airport master plan? Explain the elements of an airport master plan with examples. (10 Marks)
- (b) Aviation is a system that is vulnerable to security threats with the changing environment of the industry. Explain the different techniques and methods used by commercial airports to provide airport security. (15 Marks)

-----END OF THE QUESTION PAPER-----



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Year 3 Semester II

REPEAT EXAMINATION

Project Management – LTPM3209

- This paper consists of SEVEN (07) questions on TWELVE (12) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.
- Standard Normal Table is attached.

Date: 2023.01.16

Pass mark: 50%

Time: 02 Hours

### Question 01: (Compulsory)

Select the most appropriate answer for the following multiple-choice questions on project management practices.

1. The phases of a project life cycle are:
  - a) Starting, planning, control and closing
  - b) Concept, definition, development, handover and closure
  - c) Initiation, definition, planning, monitoring and operations
  - d) Concept, definition, implementation and operations
2. A project is typically defined in terms of scope, time, cost and which another parameter?
  - a) Benefits
  - b) Quality
  - c) Tolerance
  - d) Controls



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3. Which of the following is usually not part of the criteria for project success?
  - a) Customer satisfaction
  - b) Customer acceptance
  - c) Meeting at least 75 percent of specification requirements
  - d) Meeting the triple constraint requirements
  
4. Which of the following is generally not a benefit achieved from using project management?
  - a) Flexibility in the project's end date
  - b) Improve risk management
  - c) Improved estimating
  - d) Tracking of projects
  
5. A program is usually a group of:
  - a) Plans
  - b) People and work
  - c) Related projects
  - d) Unrelated projects
  
6. Which from the following statement(s) is/are NOT true?
  - I. Projects have defined objectives
  - II. Programs have a larger scope than projects.
  - III. The projects and programs in a portfolio must be directly related
  - a) I only
  - b) II only
  - c) III only
  - d) II and III only
  
7. Projects management is divided in \_\_\_\_\_ process groups
  - a) 5
  - b) 7
  - c) 9



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- d) 11
8. Which of the following is not a project management goal?
- a) Keeping overall costs within the budget
  - b) Delivering the software to the customer at the agreed time
  - c) Maintaining a happy and well-functioning development team
  - d) Avoiding customer complaints
9. In which of the following stages are project objectives established, teams formed, and major responsibilities assigned?
- a) Defining
  - b) Planning
  - c) Executing
  - d) Closing
10. Portfolios are a collection of any of the following:
- a) Projects, Programs, Sub-portfolios, Operations
  - b) Portfolios, Products, Projects, Sub-projects
  - c) Sub-portfolios, Projects, Sub-programs
  - d) Projects, Portfolios, Operations, Products
11. Following is(are) the responsibility(ies) of the project manager.
- a) Budgeting and cost control
  - b) Allocating resources
  - c) Tracking project expenditure
  - d) All of the above
12. From the following which is the best example for a project?
- a) Processing insurance claim
  - b) Producing automobiles
  - c) Writing an exam paper
  - d) All of the above





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13. Which of the following activities is not considered a project?
- a) Developing a new software program
  - b) Designing a space station
  - c) Developing a new advertising program
  - d) Production of automobile tires
14. Which of the following characteristics is not typical of a project manager?
- a) Managing a temporary activity
  - b) Possesses in-depth technical knowledge
  - c) Provides a direct link to the customer
  - d) Manages independently of the formal organization
15. Which of the following choices is not one of the driving forces behind the increasing demand for project management
- a) Compression of the product life cycle
  - b) Knowledge explosion
  - c) Corporate downsizing
  - d) More emphasis on the product and less on the customer
16. Which of these is not one of the constraints of a project?
- a) Scope
  - b) Resources
  - c) Team
  - d) Budget
17. Which one of the following is captured in the Work Breakdown Structure (WBS)?
- a) Lifecycle phase
  - b) Logical order of tasks
  - c) Scope of the project
  - d) Project costs



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18. Which one of the following is least likely to be a success criterion?
- A target for the project to receive zero change requests
  - The date by which the project is to be completed.
  - Delivery of products that meet required specifications
  - The awarding of bonuses to senior management
19. Which one of the following statements is true?
- A decrease in the project time is likely to increase project quality.
  - An increase in project scope is likely to increase project cost.
  - An increase in the project quality requirements is likely to decrease project cost
  - A decrease in the project cost is likely to decrease project time
20. Which stage of project management life cycle requires the maximum time of completion?
- Defining
  - Planning
  - Execution
  - Delivery
21. Which of the project management life cycle requires the maximum time to complete?
- Conceptualization
  - Planning
  - Execution
  - Estimation
22. Feasibility study determines \_\_\_\_\_
- Whether the project is possible with resources
  - Comparing the project with world class logistics norms
  - Calculate the cost crashing each unit
  - Add duration to each unit



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23. Risk in project management is defines as:
- An uncertain event that, if it occurs, has a positive effect on project objectives
  - An uncertain event that, if it occurs, has a negative effect on project objectives
  - An uncertain event that, if it occurs, has a positive or negative effect on project objectives
  - An uncertain event that does not have any effect on project objectives
24. Which one of the following best describes a project stakeholder?
- A party who is concerned about the project going ahead
  - A party with an interest or role in the project or is impacted by the project
  - A party who has a vested interest in the outcome of the project
  - A party who has a financial stake in the organization managing the project
25. What is a visual representation of a project's planned activities against a calendar called?
- A Gantt chart
  - A critical path network
  - A product flow diagram
  - A Pareto chart

(25 Marks)

### Question 02

- (a) A project is a short-termed endeavor with a predefined objectives increasingly used in company environments in strategy implementations.
- Why is it important for a project manager to understand strategy?  
(02 Marks)
  - What are the classifications of project conducted within an organization.  
(03 Marks)
- (b) An academic society of the university is preparing a social responsibility project to provide an economic relief donation for low income families in the Kaduwela municipal council area. The society has raised funds of Rs. 100,000 and received a donation of Rs. 200, 000 from a private donor and the society aims to utilize all of the funds available in organizing the project. The aim is to provide dry ration relief bag family with essential dry ration and food. The project planning and organizing is



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estimated to take a month. Thus, the project is expected to be completed by the 28<sup>th</sup> February, 2023

- (i) Write an appropriate objective for the project. (*Hint: Use SMART criterion in the objective development*).  
(04 Marks)
- (ii) Based on the information given, prepare a project priority matrix.  
(06 Marks)
- (iii) If the number of members of the project team is limited to 12 members, find the maximum number of communication lines this project could have.  
(04 Marks)
- (iv) Name 3 skills an appropriate project manager of the project need to possess in conducting the above project.  
(03 Marks)
- (v) Name 3 criteria the students could use to assess the success of the project.  
(03 Marks)

### Question 03

ABC Corporation is conducting a project develop a new savory biscuit for the product line. However, the project team is yet to conduct a risk management plan for the internal and external risks associated with the project. The project needs to focus on the market, economic, social, technological risks as well as the inherent risks such as the scarcity of resources, project management and organizational risks.

- (i) Name 2 methods ABC Corporation can use in their risk assessment process.  
(02 Marks)
- (ii) Identify at least 5 risks associated with the project based on the classifications of risks given.  
(05 Marks)
- (iii) Conduct a Scenario analysis and develop a risk assessment matrix for the risks identified in part (ii)  
(08 marks)



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- (iv) Develop appropriate risk responses and a contingency activity for each of the risks assessed to have a high probability and/ or high impact on the project in part (iii).

(10 Marks)

#### Question 04

- (a) Identify 2 differences between a Work Breakdown Structure (WBS) and a network diagram. (04 Marks)
- (b) Why does a project team develop a WBS? (04 Marks)
- (c) Name an advantage of developing a network diagram. (02 Marks)
- (d) You have signed a contract to renovate a rental home for the Perera family. You will receive a bonus of Rs. 10 000 for completing the project within 15 working days. The contract also contains a penalty clause in which you will lose Rs 5 000 for each day the project takes longer than 15 working days
- (i) Draw a project network for the renovation project based on the information given in Table 4.00 (05 Marks)
- (ii) Conduct the forward pass and backward pass and identify the critical path of the project (08 Marks)
- (iii) Identify whether you expect to receive a bonus or a penalty on this project. (02 Marks)

Table: 4.00

Activity ID	Predecessor	Time duration (Days)
A	None	2
B	A	3
C	B	4
D	C	4
E	C	1



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F	C	1
G	C	3
H	D, E, F, G	2
I	F, G	1
J	H, I	2
K	J	1

### Question 05

- (a) Name 2 methods other than PERT simulation that could be used in the risk assessment process in project management. (03 Marks)
- (b) What are the responses for opportunity management? (04 Marks)
- (c) Name 2 advantages of risk management in Project management process. (03 Marks)
- (d) Estimated times for a functional project by Phoenix Corporation are given below. The Project Manager wants to do a PERT simulation to identify the criticality of the project. Using the information given below, find the probability of completing the project by 50 days using PERT simulation.

Activity	Predecessors	Optimistic Time	Most Probable Time	Pessimistic Time
A	-	2	5	8
B	A	6	9	12
C	A	6	7	8
D	B, C	1	4	7
E	A	8	8	8
F	D, E	5	14	17
G	C	3	12	21
H	F, G	3	6	9
I	H	5	8	11

(15 Marks)



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### Question 06

(a) The scheduling of resources allows the project manager to get insights to the project duration and the reality of the targets established which leads to identification of methods to reduce the project duration.

(i) Name 3 reasons for reducing project duration. (03 Marks)

(ii) Briefly explain 3 common methods of accelerating a project. (06 Marks)

(iii) How are the project costs reduced? (02 Marks)

(b) A project is considered incompletely planned unless the resources are allocated for the activities appropriately.

(i) What are the 2 classifications of projects based on the resources scheduling issues faced by the organizations? (04 Marks)

(ii) Briefly explain the 2 methods used by the project managers to overcome the challenge of scarcity of resources. (06 Marks)

(iii) Name 2 benefits of resource scheduling at the end of project duration determination? (04 Marks)

### Question 07

(a) "Cost of a risk event increases exponentially towards the end of the project's life cycle". Briefly explain the statement with appropriate examples. (05 Marks)

(b) "Risk management is a proactive approach that aids in managing the impact of the negative consequences of a risk event". Do you agree with the statement? Justify your answer. (05 Marks)



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- (c) Assigning project work to human resource not only involves with who does what but who works with whom. Briefly explain the importance of the consideration. (05 Marks)
- (d) 'Recent knowledge explosion has affected project-oriented organizations adversely.' Do you agree with the above statement? Elaborate your answer (05 Marks)
- (e) 'A project priority system allows a company to classify and select the most important project to be implemented.' Briefly explain 2 issues an organization addresses through a project priority system. (05 Marks)

-----END OF THE QUESTION PAPER-----

*Formulae*

$$1. t_e = \frac{a+4m+b}{6}$$

$$\sigma_{t_e}^2 = \left(\frac{b-a}{6}\right)^2$$

$$Z = \frac{T_s - T_E}{\sqrt{\sum \sigma_{t_e}^2}}$$

$t_e$  - expected time

$\sigma_{t_e}^2$  - Variance of the time

Z - Probability (of meeting scheduled duration) found in statistical Table

$T_s$  - Scheduled project duration

$T_E$  - Critical path duration

2. Standard normal tables







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Year 3 Semester II  
 REPEAT EXAMINATION  
 Econometrics – LTEC3211

- This paper consists of SEVEN (07) questions on SIX (06) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.
- Formulae sheet and Statistical tables are attached.

Date: 2023.01.14

Pass mark: 50%

Time: 02 Hours

### Question 01 (Compulsory)

The following data relate to the scores obtained by 9 students of a class in a final test and their assignment marks.

Table 1.1: Students Marks

Student	A	B	C	D	E	F	G	H	I
Final Marks (Y <sub>i</sub> )	60	70	60	70	90	60	90	50	80
Assignment Marks (X <sub>i</sub> )	40	70	50	60	70	40	80	60	70

(a) Draw a scatter diagram for the data in Table 1.1

(05 Marks)



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- (b) Test whether there is a linear association between  $Y_i$  and  $X_i$  (10 Marks)
- (c) Find the regression equation for Students marks (10 Marks)

### Question 02

Use the information given in question 01,

- (a) Is it best fit line? Prove that (07 Marks)
- (b) Plot the regression line on the scatter diagram (part (a)) and show the deviations of each  $Y_i$  from the corresponding  $\hat{Y}_i$ . (08Marks)
- (c) Calculate % error of observations and comment on that (10 Marks)

### Question 03

- (a) You are given following daily productivity values of a company. The production manager said that daily productivity is 28. (use 95% confidence) Test the statement (10 marks)

30	20	35	28	30	32	28	29		34	35
----	----	----	----	----	----	----	----	--	----	----

- (b) Average and standard deviation of running distance in a sample of motor vehicles per hour is 40 and 5 kilometers respectively. It is expected to estimate the average running distance of motor vehicles at 95% confidence with a margin of error 1.225. calculate the size of the motor vehicle sample (05 Marks)
- (c) It is expected that 60% of employees in the company should be male employees. Selecting a sample size of 250 employees, this should be tested at 5% level of significance. 58% of the sample is male employees. Test the hypothesis (10 Marks)



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### Question 04

Four companies which produce food item say that their products are equal in quality. You need to test this statement and collected data with regard to vitamin content. Information is provided by the following table. Construct one way ANOVA and test the statement. (25 Marks)

Company A (Mg)	Company B (Mg)	Company C (Mg)	Company D (Mg)
10	8	10	13
14	10	11	14
13	9	12	10
12	3	12	11
12	8	14	12

### Question 05

the following SPSS output obtained by a researcher data on Price of X, Price of Y and Quantity demanded of product X.

Descriptive Statistics

	Mean	Std. Deviation	N
QDX	148.50	13.243	10
Price of the Y	61.50	9.009	10
Price of the X	192.80	16.552	10



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### Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.986 <sup>a</sup>	.973	.965	2.474	1.885

### Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	31.832	13.893		2.291	.056
	Price of Y	.869	.269	.591	3.228	.014
	Price of X	.328	.146	.410	2.240	.040

a. Dependent Variable: QDx

Interpret the above results with appropriate hypothesis

(25 Marks)

### Question 06

- (a) Following results obtained on weight of a person and his or her age and gender.  
 (1 coded for Male while 0 coded for Female)



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Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1(Constant)	-1687.115	813.844		-2.073	.051
Age	118.670	20.959	.765	5.662	.000
Gender	166.279	74.573	.301	2.230	.037

a. Dependent Variable: Weight

- I. Write appropriate hypothesis and test (10 Marks)
- II. Write and interpret the equation (05 Marks)

- a. You are given following SPSS output on results comparison of productivity of employees after the specific training program. Write appropriate hypothesis and test it and write your recommendations (10 Marks)

Paired Samples Statistics

	Mean	N	Std. Deviation	Std. Error Mean
Pair 1 Productivity before	52.6000	10	21.17756	6.69693
Productivity after	59.9000	10	17.94095	5.67343

Paired Samples Correlations

	N	Correlation	Sig.
Pair 1 Productivity before & Productivity after	10	.957	.000



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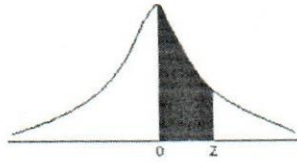
### Question 07

Write short notes on 05 (five) of followings.

- a) Methodology of Econometrics
- b) Types of Data
- c) Polynomial Regression Model
- d) Ordinary Least Squared Method
- e) Sampling Distribution
- f) Assumptions of OLS method

(5\*5 Marks)

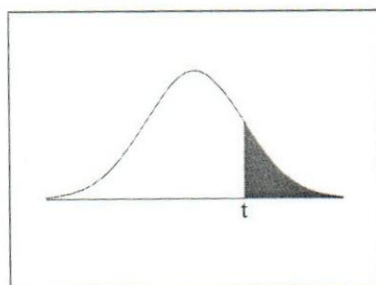
-----END OF THE QUESTION PAPER-----



Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.0000	0.0040	0.0080	0.0120	0.0160	0.0199	0.0239	0.0279	0.0319	0.0359
0.1	0.0398	0.0438	0.0478	0.0517	0.0557	0.0596	0.0636	0.0675	0.0714	0.0753
0.2	0.0793	0.0832	0.0871	0.0910	0.0948	0.0987	0.1026	0.1064	0.1103	0.1141
0.3	0.1179	0.1217	0.1255	0.1293	0.1331	0.1368	0.1406	0.1443	0.1480	0.1517
0.4	0.1554	0.1591	0.1628	0.1664	0.1700	0.1736	0.1772	0.1808	0.1844	0.1879
0.5	0.1915	0.1950	0.1985	0.2019	0.2054	0.2088	0.2123	0.2157	0.2190	0.2224
0.6	0.2257	0.2291	0.2324	0.2357	0.2389	0.2422	0.2454	0.2486	0.2517	0.2549
0.7	0.2580	0.2611	0.2642	0.2673	0.2704	0.2734	0.2764	0.2794	0.2823	0.2852
0.8	0.2881	0.2910	0.2939	0.2967	0.2995	0.3023	0.3051	0.3078	0.3106	0.3133
0.9	0.3159	0.3186	0.3212	0.3238	0.3264	0.3289	0.3315	0.3340	0.3365	0.3389
1.0	0.3413	0.3438	0.3461	0.3485	0.3508	0.3531	0.3554	0.3577	0.3599	0.3621
1.1	0.3643	0.3665	0.3686	0.3708	0.3729	0.3749	0.3770	0.3790	0.3810	0.3830
1.2	0.3849	0.3869	0.3888	0.3907	0.3925	0.3944	0.3962	0.3980	0.3997	0.4015
1.3	0.4032	0.4049	0.4066	0.4082	0.4099	0.4115	0.4131	0.4147	0.4162	0.4177
1.4	0.4192	0.4207	0.4222	0.4236	0.4251	0.4265	0.4279	0.4292	0.4306	0.4319
1.5	0.4332	0.4345	0.4357	0.4370	0.4382	0.4394	0.4406	0.4418	0.4429	0.4441
1.6	0.4452	0.4463	0.4474	0.4484	0.4495	0.4505	0.4515	0.4525	0.4535	0.4545
1.7	0.4554	0.4564	0.4573	0.4582	0.4591	0.4599	0.4608	0.4616	0.4625	0.4633
1.8	0.4641	0.4649	0.4656	0.4664	0.4671	0.4678	0.4686	0.4693	0.4699	0.4706
1.9	0.4713	0.4719	0.4726	0.4732	0.4738	0.4744	0.4750	0.4756	0.4761	0.4767
2.0	0.4772	0.4778	0.4783	0.4788	0.4793	0.4798	0.4803	0.4808	0.4812	0.4817
2.1	0.4821	0.4826	0.4830	0.4834	0.4838	0.4842	0.4846	0.4850	0.4854	0.4857
2.2	0.4861	0.4864	0.4868	0.4871	0.4875	0.4878	0.4881	0.4884	0.4887	0.4890
2.3	0.4893	0.4896	0.4898	0.4901	0.4904	0.4906	0.4909	0.4911	0.4913	0.4916
2.4	0.4918	0.4920	0.4922	0.4925	0.4927	0.4929	0.4931	0.4932	0.4934	0.4936
2.5	0.4938	0.4940	0.4941	0.4943	0.4945	0.4946	0.4948	0.4949	0.4951	0.4952
2.6	0.4953	0.4955	0.4956	0.4957	0.4959	0.4960	0.4961	0.4962	0.4963	0.4964
2.7	0.4965	0.4966	0.4967	0.4968	0.4969	0.4970	0.4971	0.4972	0.4973	0.4974
2.8	0.4974	0.4975	0.4976	0.4977	0.4977	0.4978	0.4979	0.4979	0.4980	0.4981
2.9	0.4981	0.4982	0.4982	0.4983	0.4984	0.4984	0.4985	0.4985	0.4986	0.4986
3.0	0.49865	0.49869	0.49874	0.49878	0.49882	0.49886	0.49889	0.49893	0.49896	0.49900
3.1	0.49903	0.49906	0.49910	0.49913	0.49916	0.49918	0.49921	0.49924	0.49926	0.49929
3.2	0.49931	0.49934	0.49936	0.49938	0.49940	0.49942	0.49944	0.49946	0.49948	0.49950
3.3	0.49952	0.49953	0.49955	0.49957	0.49958	0.49960	0.49961	0.49962	0.49964	0.49965
3.4	0.49966	0.49968	0.49969	0.49970	0.49971	0.49972	0.49973	0.49974	0.49975	0.49976
3.5	0.49977	0.49978	0.49978	0.49979	0.49980	0.49981	0.49981	0.49982	0.49983	0.49983



## t-Distribution Table



The shaded area is equal to  $\alpha$  for  $t = t_{\alpha}$ .

$df$	$t_{.100}$	$t_{.050}$	$t_{.025}$	$t_{.010}$	$t_{.005}$
1	3.078	6.314	12.706	31.821	63.657
2	1.886	2.920	4.303	6.965	9.925
3	1.638	2.353	3.182	4.541	5.841
4	1.533	2.132	2.776	3.747	4.604
5	1.476	2.015	2.571	3.365	4.032
6	1.440	1.943	2.447	3.143	3.707
7	1.415	1.895	2.365	2.998	3.499
8	1.397	1.860	2.306	2.896	3.355
9	1.383	1.833	2.262	2.821	3.250
10	1.372	1.812	2.228	2.764	3.169
11	1.363	1.796	2.201	2.718	3.106
12	1.356	1.782	2.179	2.681	3.055
13	1.350	1.771	2.160	2.650	3.012
14	1.345	1.761	2.145	2.624	2.977
15	1.341	1.753	2.131	2.602	2.947
16	1.337	1.746	2.120	2.583	2.921
17	1.333	1.740	2.110	2.567	2.898
18	1.330	1.734	2.101	2.552	2.878
19	1.328	1.729	2.093	2.539	2.861
20	1.325	1.725	2.086	2.528	2.845
21	1.323	1.721	2.080	2.518	2.831
22	1.321	1.717	2.074	2.508	2.819
23	1.319	1.714	2.069	2.500	2.807
24	1.318	1.711	2.064	2.492	2.797
25	1.316	1.708	2.060	2.485	2.787
26	1.315	1.706	2.056	2.479	2.779
27	1.314	1.703	2.052	2.473	2.771
28	1.313	1.701	2.048	2.467	2.763
29	1.311	1.699	2.045	2.462	2.756
30	1.310	1.697	2.042	2.457	2.750
32	1.309	1.694	2.037	2.449	2.738
34	1.307	1.691	2.032	2.441	2.728
36	1.306	1.688	2.028	2.434	2.719
38	1.304	1.686	2.024	2.429	2.712
$\infty$	1.282	1.645	1.960	2.326	2.576

## CRITICAL VALUES for the "F" Distribution, ALPHA = .05.

Denominator DF	Numerator DF									
	1	2	3	4	5	6	7	8	9	10
1	161.448	199.500	215.707	224.583	230.162	233.986	236.768	238.883	240.543	241.882
2	18.513	19.000	19.164	19.247	19.296	19.330	19.353	19.371	19.385	19.396
3	10.128	9.552	9.277	9.117	9.013	8.941	8.887	8.845	8.812	8.786
4	7.709	6.944	6.591	6.388	6.256	6.163	6.094	6.041	5.999	5.964
5	6.608	5.786	5.409	5.192	5.050	4.950	4.876	4.818	4.772	4.735
6	5.987	5.143	4.757	4.534	4.387	4.284	4.207	4.147	4.099	4.060
7	5.591	4.737	4.347	4.120	3.972	3.866	3.787	3.726	3.677	3.637
8	5.318	4.459	4.066	3.838	3.687	3.581	3.500	3.438	3.388	3.347
9	5.117	4.256	3.863	3.633	3.482	3.374	3.293	3.230	3.179	3.137
10	4.965	4.103	3.708	3.478	3.326	3.217	3.135	3.072	3.020	2.978
11	4.844	3.982	3.587	3.357	3.204	3.095	3.012	2.948	2.896	2.854
12	4.747	3.885	3.490	3.259	3.106	2.996	2.913	2.849	2.796	2.753
13	4.667	3.806	3.411	3.179	3.025	2.915	2.832	2.767	2.714	2.671
14	4.600	3.739	3.344	3.112	2.958	2.848	2.764	2.699	2.646	2.602
15	4.543	3.682	3.287	3.056	2.901	2.790	2.707	2.641	2.588	2.544
16	4.494	3.634	3.239	3.007	2.852	2.741	2.657	2.591	2.538	2.494
17	4.451	3.592	3.197	2.965	2.810	2.699	2.614	2.548	2.494	2.450
18	4.414	3.555	3.160	2.928	2.773	2.661	2.577	2.510	2.456	2.412
19	4.381	3.522	3.127	2.895	2.740	2.628	2.544	2.477	2.423	2.378
20	4.351	3.493	3.098	2.866	2.711	2.599	2.514	2.447	2.393	2.348
21	4.325	3.467	3.072	2.840	2.685	2.573	2.488	2.420	2.366	2.321
22	4.301	3.443	3.049	2.817	2.661	2.549	2.464	2.397	2.342	2.297
23	4.279	3.422	3.028	2.796	2.640	2.528	2.442	2.375	2.320	2.275
24	4.260	3.403	3.009	2.776	2.621	2.508	2.423	2.355	2.300	2.255
25	4.242	3.385	2.991	2.759	2.603	2.490	2.405	2.337	2.282	2.236
26	4.225	3.369	2.975	2.743	2.587	2.474	2.388	2.321	2.265	2.220
27	4.210	3.354	2.960	2.728	2.572	2.459	2.373	2.305	2.250	2.204
28	4.196	3.340	2.947	2.714	2.558	2.445	2.359	2.291	2.236	2.190
29	4.183	3.328	2.934	2.701	2.545	2.432	2.346	2.278	2.223	2.177
30	4.171	3.316	2.922	2.690	2.534	2.421	2.334	2.266	2.211	2.165
31	4.160	3.305	2.911	2.679	2.523	2.409	2.323	2.255	2.199	2.153
32	4.149	3.295	2.901	2.668	2.512	2.399	2.313	2.244	2.189	2.142
33	4.139	3.285	2.892	2.659	2.503	2.389	2.303	2.235	2.179	2.133
34	4.130	3.276	2.883	2.650	2.494	2.380	2.294	2.225	2.170	2.123
35	4.121	3.267	2.874	2.641	2.485	2.372	2.285	2.217	2.161	2.114
36	4.113	3.259	2.866	2.634	2.477	2.364	2.277	2.209	2.153	2.106
37	4.105	3.252	2.859	2.626	2.470	2.356	2.270	2.201	2.145	2.098
38	4.098	3.245	2.852	2.619	2.463	2.349	2.262	2.194	2.138	2.091
39	4.091	3.238	2.845	2.612	2.456	2.342	2.255	2.187	2.131	2.084
40	4.085	3.232	2.839	2.606	2.449	2.336	2.249	2.180	2.124	2.077
41	4.079	3.226	2.833	2.600	2.443	2.330	2.243	2.174	2.118	2.071
42	4.073	3.220	2.827	2.594	2.438	2.324	2.237	2.168	2.112	2.065
43	4.067	3.214	2.822	2.589	2.432	2.318	2.232	2.163	2.106	2.059
44	4.062	3.209	2.816	2.584	2.427	2.313	2.226	2.157	2.101	2.054
45	4.057	3.204	2.812	2.579	2.422	2.308	2.221	2.152	2.096	2.049
46	4.052	3.200	2.807	2.574	2.417	2.304	2.216	2.147	2.091	2.044
47	4.047	3.195	2.802	2.570	2.413	2.299	2.212	2.143	2.086	2.039
48	4.043	3.191	2.798	2.565	2.409	2.295	2.207	2.138	2.082	2.035
49	4.038	3.187	2.794	2.561	2.404	2.290	2.203	2.134	2.077	2.030
50	4.034	3.183	2.790	2.557	2.400	2.286	2.199	2.130	2.073	2.026

## CRITICAL VALUES for the "F" Distribution, ALPHA = .05.

Denominator DF	Numerator DF									
	1	2	3	4	5	6	7	8	9	10
51	4.030	3.179	2.786	2.553	2.397	2.283	2.195	2.126	2.069	2.022
52	4.027	3.175	2.783	2.550	2.393	2.279	2.192	2.122	2.066	2.018
53	4.023	3.172	2.779	2.546	2.389	2.275	2.188	2.119	2.062	2.015
54	4.020	3.168	2.776	2.543	2.386	2.272	2.185	2.115	2.059	2.011
55	4.016	3.165	2.773	2.540	2.383	2.269	2.181	2.112	2.055	2.008
56	4.013	3.162	2.769	2.537	2.380	2.266	2.178	2.109	2.052	2.005
57	4.010	3.159	2.766	2.534	2.377	2.263	2.175	2.106	2.049	2.001
58	4.007	3.156	2.764	2.531	2.374	2.260	2.172	2.103	2.046	1.998
59	4.004	3.153	2.761	2.528	2.371	2.257	2.169	2.100	2.043	1.995
60	4.001	3.150	2.758	2.525	2.368	2.254	2.167	2.097	2.040	1.993
61	3.998	3.148	2.755	2.523	2.366	2.251	2.164	2.094	2.037	1.990
62	3.996	3.145	2.753	2.520	2.363	2.249	2.161	2.092	2.035	1.987
63	3.993	3.143	2.751	2.518	2.361	2.246	2.159	2.089	2.032	1.985
64	3.991	3.140	2.748	2.515	2.358	2.244	2.156	2.087	2.030	1.982
65	3.989	3.138	2.746	2.513	2.356	2.242	2.154	2.084	2.027	1.980
66	3.986	3.136	2.744	2.511	2.354	2.239	2.152	2.082	2.025	1.977
67	3.984	3.134	2.742	2.509	2.352	2.237	2.150	2.080	2.023	1.975
68	3.982	3.132	2.740	2.507	2.350	2.235	2.148	2.078	2.021	1.973
69	3.980	3.130	2.737	2.505	2.348	2.233	2.145	2.076	2.019	1.971
70	3.978	3.128	2.736	2.503	2.346	2.231	2.143	2.074	2.017	1.969
71	3.976	3.126	2.734	2.501	2.344	2.229	2.142	2.072	2.015	1.967
72	3.974	3.124	2.732	2.499	2.342	2.227	2.140	2.070	2.013	1.965
73	3.972	3.122	2.730	2.497	2.340	2.226	2.138	2.068	2.011	1.963
74	3.970	3.120	2.728	2.495	2.338	2.224	2.136	2.066	2.009	1.961
75	3.968	3.119	2.727	2.494	2.337	2.222	2.134	2.064	2.007	1.959
76	3.967	3.117	2.725	2.492	2.335	2.220	2.133	2.063	2.006	1.958
77	3.965	3.115	2.723	2.490	2.333	2.219	2.131	2.061	2.004	1.956
78	3.963	3.114	2.722	2.489	2.332	2.217	2.129	2.059	2.002	1.954
79	3.962	3.112	2.720	2.487	2.330	2.216	2.128	2.058	2.001	1.953
80	3.960	3.111	2.719	2.486	2.329	2.214	2.126	2.056	1.999	1.951
81	3.959	3.109	2.717	2.484	2.327	2.213	2.125	2.055	1.998	1.950
82	3.957	3.108	2.716	2.483	2.326	2.211	2.123	2.053	1.996	1.948
83	3.956	3.107	2.715	2.482	2.324	2.210	2.122	2.052	1.995	1.947
84	3.955	3.105	2.713	2.480	2.323	2.209	2.121	2.051	1.993	1.945
85	3.953	3.104	2.712	2.479	2.322	2.207	2.119	2.049	1.992	1.944
86	3.952	3.103	2.711	2.478	2.321	2.206	2.118	2.048	1.991	1.943
87	3.951	3.101	2.709	2.476	2.319	2.205	2.117	2.047	1.989	1.941
88	3.949	3.100	2.708	2.475	2.318	2.203	2.115	2.045	1.988	1.940
89	3.948	3.099	2.707	2.474	2.317	2.202	2.114	2.044	1.987	1.939
90	3.947	3.098	2.706	2.473	2.316	2.201	2.113	2.043	1.986	1.938
91	3.946	3.097	2.705	2.472	2.315	2.200	2.112	2.042	1.984	1.936
92	3.945	3.095	2.704	2.471	2.313	2.199	2.111	2.041	1.983	1.935
93	3.943	3.094	2.703	2.470	2.312	2.198	2.110	2.040	1.982	1.934
94	3.942	3.093	2.701	2.469	2.311	2.197	2.109	2.038	1.981	1.933
95	3.941	3.092	2.700	2.467	2.310	2.196	2.108	2.037	1.980	1.932
96	3.940	3.091	2.699	2.466	2.309	2.195	2.106	2.036	1.979	1.931
97	3.939	3.090	2.698	2.465	2.308	2.194	2.105	2.035	1.978	1.930
98	3.938	3.089	2.697	2.465	2.307	2.193	2.104	2.034	1.977	1.929
99	3.937	3.088	2.696	2.464	2.306	2.192	2.103	2.033	1.976	1.928
100	3.936	3.087	2.696	2.463	2.305	2.191	2.103	2.032	1.975	1.927

## Formula sheet

$$\text{Mean} = \frac{\sum x}{n}$$

$$\text{Variance} = \frac{\sum (x - \bar{x})^2}{n-1}$$

$$\alpha = \frac{rk}{1 + (k-1)r}$$

$$JB = n \left( \frac{s^2}{6} + \frac{(k-3)^2}{24} \right)$$

$$(\bar{x}_1 - \bar{x}_2) \pm z_{\frac{\alpha}{2}} SE$$

$$SE = \sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}$$

$$SE = SP \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}$$

$$SP = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

$$TS = \frac{\bar{x} - \mu_0}{\frac{\sigma}{\sqrt{n}}}$$

$$TS = \frac{p - p_0}{\sqrt{\frac{p_0 q_0}{n}}}$$

$$TS = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{\sigma_1^2}{n_1} + \frac{\sigma_2^2}{n_2}}}$$

$$TS = \frac{\bar{x}_1 - \bar{x}_2}{SP \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}}$$

$$TS = \frac{p_1 - p_2}{\sqrt{\frac{p_1 q_1}{n_1} + \frac{p_2 q_2}{n_2}}}$$

$$\chi^2 = \sum \frac{(o - e)^2}{e}$$

$$\text{Coefficient of Correlation} = \frac{n \sum xy - \sum x \sum y}{\sqrt{(n \sum x^2 - (\sum x)^2)(n \sum y^2 - (\sum y)^2)}}$$

Normal Equations

$\hat{b}_1 = \frac{n \sum X_i Y_i - \sum X_i \sum Y_i}{n \sum X_i^2 - (\sum X_i)^2}$	$b_1 = \frac{S_{xy}}{S_{xx}}$
$\hat{b}_0 = \bar{Y} - \hat{b}_1 \bar{X}$	$r^2 = \frac{SSR}{SST} \times 100$
$r^2 = 1 - \frac{(S_{yy} - \beta_2^2 S_{xx})}{S_{yy}}$	

$$\text{Sum of Square of Regression} = \sum (\hat{Y} - \bar{Y})^2$$

$$\text{Sum of Square of Residual} = \sum (Y - \hat{Y})^2$$

$$\text{Sum of Square of Total} = \sum (Y - \bar{Y})^2$$



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Course CODE: COM551



Year 3 Semester II

REPEAT EXAMINATION

Marketing Management – LTMM3212

- This paper consists of SEVEN (07) questions on FIVE (05) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.01.12

Pass mark: 50%

Time: 02 Hours

### Question 01: (Compulsory)

#### Bembridge Airport

Bembridge Airport is on the eastern end of the Isle of Wight, a small island located off the south coast of England near the large towns of Portsmouth and Southampton. The Isle of Wight has been designated an Area of Outstanding Natural Beauty. It has agricultural and tourism industries, but tourism is its main business activity.

#### **Bembridge Airport's Importance to the Island's Economy**

Bembridge Airport is one of two airfields functioning on the island, the other being a grass airstrip at nearby Sandown. Bembridge has a tarmac runway, but this is not large enough to handle commercial passenger aircraft, so the airport's main trade comes from light aircraft. The airfield also has a gliding club on its south side and offers facilities for groups of pilots. Pilots fly into Bembridge to sample the local seafood, enjoy walks along the cliffs, and to see the island from the air. Relatively few pilots stay overnight, but the airfield can accommodate visiting aircraft and provide parking space if necessary.



Faculty of Management and Social Sciences  
Department of Logistics & Transport  
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In common with other small airfields, Bembridge has a wide variety of different enterprises on-site. It has a cafe (which is popular with non-flying visitors as well as pilots), it offers hangar space for private aircraft, and it encourages private pilots to fly in to visit the picturesque island itself. Fuel sales offer another source of revenue. Bembridge also promotes local events such as the Isle of Wight Festival.

### **Local Competition**

Competition can be strong, with pilots having a lot of choices of where to fly to, and even though the cost of the flight might run into hundreds of pounds, a five-pound difference in the landing fee might be enough to make a pilot choose another airfield.

Rival airfield Sandown represents direct competition. Sandown has a grass runway and can therefore be adversely affected by heavy rain. It also has fewer facilities, especially after a disastrous fire destroyed its restaurant and clubroom in 2007. However, Sandown hosts the annual Spamfield Fly-in for microlight aircraft, a major event in the UK aviation calendar. Microlights are cheap to buy and operate, so the sport attracts many people with relatively low incomes. Spamfield charges around £10 per aircraft to land, so Bembridge competes by charging microlights only £7.50. Larger aircraft pay progressively greater amounts, but fees remain relatively low.

### **Sources of Potential Problems**

People living near airfields often complain about the noise from aircraft, and some airfields have been forced to close because of this. Flying is seasonal and extremely weather-dependent. Bad weather means that there will be no visiting aircraft, consequently no landing fees and few people using the restaurant. Civil Aviation safety regulations are often onerous. Despite this, Bembridge still manages to be a popular and successful destination.



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*Source - CIM Past papers - Marketing Essentials - March 2011*

You are required to produce a SWOT analysis for Bembridge Airport using the information in the given case study. (25 Marks)

### Question 02

- a) With reference to the consumer buyer decision process, explain the five (05) stages a consumer may go through in buying a luxury apartment (10 Marks)
- b) Identify two (03) buyer characteristics that could influence their behavior in buying a luxury apartment. (15 Marks)

### Question 03

As a Marketing Manager you might expect to have a well-resourced and managed Marketing Information System (MIS). Though, some information is available but neither the form nor the accessibility of the data is entirely suitable for marketing purposes. Using a company of your choice, prepare a brief report for the IT Manager that;

- a) Explain the importance of Marketing Intelligence as a source of gathering data for MIS and list four (04) different sources for gathering marketing intelligence. (08 Marks)
- b) Explain the process for undertaking marketing research to collect customer information. (17 Marks)





Faculty of Management and Social Sciences  
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#### Question 04

Segmentation is fundamental to marketing and implies that distinct groups of customers should be managed in different ways. Using examples, for organisations of your choice,

- a) Explain three suitable bases that can be used to segment the market.  
(15 Marks)
- b) Finding point of differentiation (Value differences) is very important to position the company products in consumer's mind. Explain two suitable point of differentiations for the organization that you have selected.  
(10 Marks)

#### Question 05

- a) Discuss the challenges faced by a traditional product-oriented organisations in becoming market-oriented in a turbulent environment.  
(05 Marks)
- b) "Unlike physical products, intangible products cannot be seen, tasted, felt, heard, or smelled before they are purchased. Therefore, almost all services contain some physical elements". Explain this statement using examples of your choice.  
(10 Marks)
- c) "Virtually all services are reliant on people to perform them, very often dealing directly with the consumer". Explain this statement using examples of your choice.  
(10 Marks)

#### Question 06

As a Marketing Assistant working within the marketing department of a global internet-based clothing brand, you have been asked by your manager to:



Faculty of Management and Social Sciences  
Department of Logistics & Transport  
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- a) Discuss how product attributes and packaging need to be considered to satisfy the customer requirement. (15 Marks)
- b) Company is planning to introduce a new clothing line. Advice on suitable pricing strategy for their new clothing line. (10 Marks)

### Question 07

You work for a large cosmetics company operating in the FMCG industry. The management is presently in the process of establishing a business outlet in a new geographical area. As the assistant sales manager, you are required to,

- a) Recommend **Three** suitable communication tools that the company could use to capture the new market. (15 Marks)
- b) Recommend a suitable strategy for the company when selecting number of channel members in their new are of business. (10 Marks)

-----END OF THE QUESTION PAPER-----



Faculty of Management and Social Sciences  
Department of Logistics & Transport  
BSc Hons in Logistics and Transportation  
Course CODE: COM551

Year 3 Semester II

REPEAT EXAMINATION

Marketing Management – LTMM3212

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-----END OF THE QUESTION PAPER-----



Faculty of Management and Social Sciences  
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Course CODE: COM551



Year 3 Semester II

## REPEAT EXAMINATION

### Transport Contract and Regulations – LTTR3213

- This paper consists of SEVEN (07) questions on THREE (03) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.01.12

Pass mark: 50%

Time: 02 Hours

#### Question 01: Compulsory

- a) Discuss the element of a valid contract. (10 marks)
- b) What are the differences between unilateral and bilateral contracts? (5 marks)
- c) What are the four ways to terminate the contract? (10 marks)

#### Question 02

- a) What are terms and conditions in a contract? (5 marks)
- b) What is the classification of terms? (10 marks)
- c) Explain the difference between conditions, warranties and innominate terms? (10 marks)





Faculty of Management and Social Sciences  
Department of Logistics & Transport  
BSc Hons in Logistics and Transportation  
Course CODE: COM551

### Question 03

- a) What is a bill of lading? (5 marks)
- b) What are the main functions of a bill of lading? (10 marks)
- c) Compare and contrast between the bill of lading and charterparties. (10 marks)

### Question 04

- a) What is a contract of affreightment? (5 marks)
- b) How many types of carriers are there under a contract of affreightment? (10 marks)
- c) Explain the types of charterparties. (10 marks)

### Question 05

- a) What are the differences between sole proprietorship, partnership and corporation? (10 marks)
- b) List down the advantages and disadvantages of sole proprietorship, partnership and corporation. (10 marks)
- c) what are limited liability companies? (5 marks)



Faculty of Management and Social Sciences  
Department of Logistics & Transport  
BSc Hons in Logistics and Transportation  
Course CODE: COM551

### Question 06

- a) List down different types of Liens and explain each of them. (5 Marks)
- b) Describe the Maritime Arbitration and methods of dispute resolution. (10 Marks)
- c) What is an "Agency" and explain the three participants involved in an agency relationship? (10 marks)

### Question 07

Write short notes

- a) Hague Visby Rules. (5 marks)
- b) Bill of Exchange. (5 marks)
- c) Innominate terms. (5 marks)
- d) Types of agencies. (5 marks)
- e) INCOTERMS (5 marks)

-----END OF THE QUESTION PAPER-----



Faculty of Management and Social Sciences  
 Department of Logistics & Transport  
 BSc Hons in Logistics and Transportation  
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Year 3 Semester II

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Faculty of Management and Social Sciences  
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Faculty of Management and Social Sciences  
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Year 3 Semester II

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-----END OF THE QUESTION PAPER-----



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Department of Logistics and Transport  
BSc (Hons.) in Logistics and Transportation  
Course Code: COM 551



Year 3 Semester 2

REPEAT EXAMINATION

Research Methodology – LTRM3214

- This paper consists of SEVEN (07) questions on FIVE (05) pages.
- Answer only FOUR (04) Questions including Question Number ONE.
- Only Non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write legibly.

Date: 2023.01.11

Pass mark: 50%

Time: 02 Hours

### Question: 01

#### Abstract

A paradigm shift is a significant adjustment of a scientific discipline's underlying ideas and methods of experimentation. In the previous few decades, there has been a significant transformation in the field of education, at all levels – primary, secondary, and university. State universities are the main pillars of tertiary education and few private sector institutions are also among of it. A few state universities provide tourism education including very few private sector institutions, yet all provide traditional tourism degree programs and none of the focus industry orient degree programs. The aim of this study is to identify the importance of building psychometric test for the tourism education in Sri Lanka. The methodology of the study is based on the Dimensional factors of student selection Hossler (1999), Kotler and Fox (1995), Marketing Mix model for higher



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education and Combined Complex Decision model, (Holdsworth and Nind, 2005) also methodology serve as a framework of identifying elements of contextual framework of the demand pull and supply push factors which are affecting to the university choice among the tourism education in Sri Lanka. The study used both qualitative and quantitative approaches and the population and study population demarcated to identify the university choice of the for the new entrants of the country to draft a framework for psychometric test for tourism education. Sample was drawn based stratified sampling technique and sample is clustered into several sub clusters such as state universities and private universities, The study used both descriptive and essential inferential statistics tools to derive the analysis to meet the objectives of the study. One of the successful findings of this study is to identify the comprehensive conceptual framework by endorsing the psychometric test for tourism education in Sri Lanka.

**Read the above abstract carefully and identify the following terms,**

- a) Research Question
- b) Research Objective
- c) Methodology of the study
- d) Population, Sample and Methods of data Collection
- e) Key Research Findings (Each 05\*5 =25 Marks)

**Question: 02**

- a) Determine the benefits of research to the service providers (Logistics Service Providers) (05 Marks)
- b) "Epistemology in business research as a branch of philosophy deals with the sources of knowledge". Briefly explain how knowledge is applied for the practical research studies. (06 Marks)



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- c) Briefly explain the difference between Applied Research and Market Research with the aid of an example. (07 Marks)
- d) Briefly describe the term of Cross-sectional studies in research with the aid of an example. (07 Marks)

### Question : 03

- a) Identify the components of the Empirical Phase of the research process. (05 Marks)
- b) Determine the characteristics that you need to pay attention when you plan your research ?. (05 Marks)
- c) Briefly describe the Systematic Sampling technique with the aid of an example. (07 Marks)
- d) "Action Research is a method of systematic enquiry that teachers undertake as researchers of their own practice". Briefly describe the statement. (08 Marks)

### Question: 04

- a) Briefly explain the term of Conceptual Framework with the aid of an example. (06 Marks)
- b) Determine the existing literally sources (Three Sources) use for the literature review of a research. (05 Marks)
- c) "Experimental Research Design is a framework of protocols and procedures created to conduct experimental research with a scientific approach using two sets of variables". Briefly explain the statement. (06 Marks)



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- d) "Identifying the gap in existing research studies is a significant element of conducting a comprehensive literature review". Explain the statement with the aid of an example. (08 Marks)

**Question: 05**

- a) Briefly explain the role of the researcher in participatory observation. (05 Marks)
- b) Briefly explain the association between independent variable and Dependent variables with the aid of an example. (05 Marks)
- c) "Quantitative research is the process of collecting and analyzing numerical data". Briefly explain the significance of a Quantitative Research in Supply Chain Industry, (07 Marks)
- d) People travel for a variety of reasons, including business, formal meetings, reunions with friends and family, education, healthcare, and even pleasure. Tourism is defined as a leisure activity in which individuals spend a few days in a new location to appreciate new surroundings, try new foods, and breathe fresh air. Not all travelers are tourists, but all tourists are travelers (Hasa,2016). Paraphrase the statement using the knowledge of reference and citation. (08 Marks)

**Question: 06**

- a) Briefly explain the term of Operational framework with the aid of an example. (08 Marks)
- b) Briefly explain the deference between Research Methods and Research Methodology of a study with the aid of an example (07 Marks)
- c) Hypothesis is one of the most important aspects of research design. Briefly explain the statement with the aid of a Hypothesis example. (10 Marks)



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**Question : 07**

Briefly explain the following terms with the aid of an example. Select only 05 Terms.

- a) Likert Scale
- b) Judgmental Sampling
- c) Hypothesis
- d) Plagiarism
- e) Survey
- f) Non-Parametric Tests
- g) Peer to Peer Interviews
- h) Focus group discussion
- i) Dependent Variable
- j) Secondary Data

(Each 05\*5 =25 Marks)

-----END OF THE QUESTION PAPER-----

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Year 3 Semester 2

REPEAT EXAMINATION

Research Methodology – LTRM3214

- This paper consists of SEVEN (07) questions on FIVE (05) pages.
- Answer only FOUR (04) Questions including Question Number ONE.
- Only Non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write legibly.

Date: 2023.01.11

Pass mark: 50%

Time: 02 Hours

### Question: 01

#### Abstract

A paradigm shift is a significant adjustment of a scientific discipline's underlying ideas and methods of experimentation. In the previous few decades, there has been a significant transformation in the field of education, at all levels – primary, secondary, and university. State universities are the main pillars of tertiary education and few private sector institutions are also among of it. A few state universities provide tourism education including very few private sector institutions, yet all provide traditional tourism degree programs and none of the focus industry orient degree programs. The aim of this study is to identify the importance of building psychometric test for the tourism education in Sri Lanka. The methodology of the study is based on the Dimensional factors of student selection Hossler (1999), Kotler and Fox (1995), Marketing Mix model for higher



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education and Combined Complex Decision model, (Holdsworth and Nind, 2005) also methodology serve as a framework of identifying elements of contextual framework of the demand pull and supply push factors which are affecting to the university choice among the tourism education in Sri Lanka. The study used both qualitative and quantitative approaches and the population and study population demarcated to identify the university choice of the for the new entrants of the country to draft a framework for psychometric test for tourism education. Sample was drawn based stratified sampling technique and sample is clustered into several sub clusters such as state universities and private universities, The study used both descriptive and essential inferential statistics tools to derive the analysis to meet the objectives of the study. One of the successful findings of this study is to identify the comprehensive conceptual framework by endorsing the psychometric test for tourism education in Sri Lanka.

**Read the above abstract carefully and identify the following terms,**

- a) Research Question
- b) Research Objective
- c) Methodology of the study
- d) Population, Sample and Methods of data Collection
- e) Key Research Findings

(Each 05\*5 =25 Marks)

**Question: 02**

- a) Determine the benefits of research to the service providers (Logistics Service Providers) (05 Marks)
- b) "Epistemology in business research as a branch of philosophy deals with the sources of knowledge". Briefly explain how knowledge is applied for the practical research studies. (06 Marks)



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- c) Briefly explain the difference between Applied Research and Market Research with the aid of an example. (07 Marks)
- d) Briefly describe the term of Cross-sectional studies in research with the aid of an example. (07 Marks)

### Question : 03

- a) Identify the components of the Empirical Phase of the research process. (05 Marks)
- b) Determine the characteristics that you need to pay attention when you plan your research ?. (05 Marks)
- c) Briefly describe the Systematic Sampling technique with the aid of an example. (07 Marks)
- d) "Action Research is a method of systematic enquiry that teachers undertake as researchers of their own practice". Briefly describe the statement. (08 Marks)

### Question: 04

- a) Briefly explain the term of Conceptual Framework with the aid of an example. (06 Marks)
- b) Determine the existing literally sources (Three Sources) use for the literature review of a research. (05 Marks)
- c) "Experimental Research Design is a framework of protocols and procedures created to conduct experimental research with a scientific approach using two sets of variables". Briefly explain the statement. (06 Marks)





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- d) "Identifying the gap in existing research studies is a significant element of conducting a comprehensive literature review". Explain the statement with the aid of an example.  
(08 Marks)

**Question: 05**

- a) Briefly explain the role of the researcher in participatory observation. (05 Marks)
- b) Briefly explain the association between independent variable and Dependent variables with the aid of an example. (05 Marks)
- c) "Quantitative research is the process of collecting and analyzing numerical data". Briefly explain the significance of a Quantitative Research in Supply Chain Industry, (07 Marks)
- d) People travel for a variety of reasons, including business, formal meetings, reunions with friends and family, education, healthcare, and even pleasure. Tourism is defined as a leisure activity in which individuals spend a few days in a new location to appreciate new surroundings, try new foods, and breathe fresh air. Not all travelers are tourists, but all tourists are travelers (Hasa,2016). Paraphrase the statement using the knowledge of reference and citation. (08 Marks)

**Question: 06**

- a) Briefly explain the term of Operational framework with the aid of an example. (08 Marks)
- b) Briefly explain the deference between Research Methods and Research Methodology of a study with the aid of an example (07 Marks)
- c) Hypothesis is one of the most important aspects of research design. Briefly explain the statement with the aid of a Hypothesis example. (10 Marks)



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**Question : 07**

Briefly explain the following terms with the aid of an example. Select only 05 Terms.

- a) Likert Scale
- b) Judgmental Sampling
- c) Hypothesis
- d) Plagiarism
- e) Survey
- f) Non-Parametric Tests
- g) Peer to Peer Interviews
- h) Focus group discussion
- i) Dependent Variable
- j) Secondary Data

(Each 05\*5 =25 Marks)

-----END OF THE QUESTION PAPER-----



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Year 3 Semester II

REPEAT EXAMINATION

Airport Planning and Management – LTAM3210

- This paper consists of SEVEN (07) questions on THREE (03) pages.
- Answer FOUR (04) Questions including Question 01.
- Only non-programmable calculators are allowed.
- You may use appropriate graphs, diagrams, equation/s to prove or justify the answers.
- If you have any doubt as to the interpretation of the wording of a question, make your own decision, but clearly state it on the script.
- Write Legibly.

Date: 2023.01.10

Pass mark: 50%

Time: 02 Hours

### Question 01: (Compulsory)

- (a) Define delay and capacity. Identify factors that cause delays in an airport and explain strategies that can be used by the airport management to overcome these factors that cause delays. (12 Marks)
- (b) Briefly explain why air traffic control is necessary. (04 marks)
- (c) Explain the 3(three) types of Air traffic control (ATC) services provided by Airport and Aviation Services Sri Lanka (AASL). (09 Marks)

### Question 02

- (a) Aviation is a system that is vulnerable to security threats with the changing environment of the industry. Explain the different techniques and methods used by commercial airports to provide airport security. (12 Marks)
- (b) Explain the difference between private and government owned airports in terms of the ownership style. In your view what type of an ownership style is more suitable for Mattala Rajapaksha International Airport? (13 Marks)



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### Question 03

- (a) Airports are among the largest public facilities in the world. Airports play different roles in shaping the economic, political, and environmental aspects of the communities they serve. Explain in detail the economic role and the political role played by an airport operating at its maximum capacity. (25 Marks)

### Question 04

- (a) Explain how pilots make use of Visual Approach Slope Indicators (VASI) and Precision Approach Path Indicators (PAPI) when approaching to land in an airport. (10 Marks)
- (b) Apart from airfield lightings and markings there are different types of signs that are installed on airfields in order to provide more precise and accurate information for pilots to navigate the aircraft in the airfield. These signs fall into different categories. Identify 2(two) main categories and explain 2(two) signs each for the category identified by you with graphical illustrations. (15 marks)

### Question 05

- (a) Explain 3(three) types of airport terminal configurations with the use of appropriate graphical illustrations. In your view, what is the terminal configuration that best suit an airport like Bandaranaike International Airport? (13 Marks)
- (b) What is meant by an Airport master plan? Explain the elements of an airport master plan with examples. (12 Marks)

### Question 06

- (a) Differentiate between aeronautical charges and non-aeronautical charges with examples. (06 Marks)



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- (b) Briefly explain the residual cost approach and compensatory cost approach used by airports for financial management. (06 Marks)
- (c) Financing of large scale airport projects is always a concern for airport owners and operators due to the large amounts of capital required. Explain different sources of financing available for airport infrastructure. (13 Marks)

### Question 07

Airports are changing fast, as the rise of new technologies and growing environmental concerns play a crucial role in shaping the future of aviation. Explain strategies that airports must adopt to survive in the future.

(25 Marks)

-----END OF THE QUESTION PAPER-----