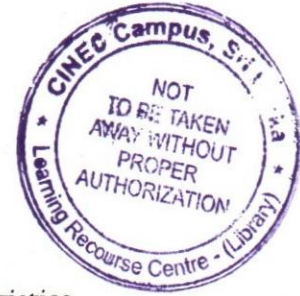CINEC CAMPUS
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## Past Papers

Faculty of Humanities & social Sciences
Department of Logistics & Transportation

# Bsc.in International Transportation Management and Logistics Transportation

# (Year 1 – Semester II)

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Faculty of Management and Social Sciences
Department of Logistics & Transport
BSc in International Transportation Management and Logistics
Course CODE: COM550

## Year 1 Semester II

## SEMESTER END EXAMINATION

## Transport Geography – TGEO0302

- This paper consists of EIGHT questions on FOUR (04) pages.
- Answer FIVE 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: 2022.09.27          Pass mark: 50%          Time: 03 Hours

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## Question 01 (Compulsory)

Describe in your own words, the major challenges faced by urban freight transportation in Sri Lanka and propose the solutions and mitigation strategies to overcome those challenges.                    (20 Marks)

## Question 02

**It's being accepted worldwide that "There is no transportation without geography and there's no geography without transportation".**

a) Explain in your own words how transportation is influenced by geography as well as influencing it.                    (06 Marks)
b) What's the difference between geographic concentration and geographic specialization?                    (04 Marks)
c) Describe with an example in the modern day, how the transportation has overcome physical environment with technology.                    (10 Marks)

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## Question 03

"COHO Delivery company struggles with the minimization of transportation costs in their day to day operations as they don't follow a proper transport network strategy to deliver the parcels to their customers".

a) As a student learning Transport Geography module, mention the most suitable structure for the above scenario by highlighting the benefits of using the mentioned network structure. (10 Marks)

b) "The reciprocity of transportation are majorly two types". Mention and explain the two types. (05 Marks)

c) Name three transportations infrastructure and the constraints that they possess.

(05 Marks)

## Question 04

a) "Containerized transportation substantially changed port dynamics". Explain in your own words. (05 Marks)

b) Distinguish between Monofunctional and Polyfunctional terminals. (06 Marks)

c) Briefly explain the factors that impact the airport traffic. (09 Marks)

## Question 05

a) What's urbanization? What are the three major demographic trends that drives urbanization? (07 Marks)

b) Explain the vicious cycle of congestion. (08 Marks)

c) Explain how the two concepts called "**Urban Sprawl**" and "**Transportation**" are related to each other. (05 Marks)

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## Question 06

**"Rail Terminals are majorly categorized into two as passenger and freight. Thus, it's known that Shunting yards are not necessarily a terminal since they do not handle passengers or cargo"**

a) Explain in your words, what shunting is? (05 Marks)

b) Explain the structural effect of "Adjacency "in the location of rail terminals.

(05 Marks)

c) Terminal dwell time is categorized majorly into three categories. Name and describe in your own words, the three major types of terminal dwell time.

(06 Marks)

d) What're the major attributes linked with the performance of a transportation terminal? (04 Marks)

## Question 07

a) "Urban sprawl reflects a strong **negative relationship** between urban density and automobile use emerged". Explain (06 Marks)

b) The concept of city logistics has become popular in the recent past with the urbanization. Explain in your words, the concept of **"City Logistics".** (04 Marks)

c) Explain in detail, the main driving factors of city logistics with appropriate examples. (10 Marks)

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## Question 08

Write short notes on below topics                    (04*05 Marks)

a) Manufacturing districts.

b) Congestion.

c) Pendulum movements

d) Rationalization of deliveries.

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

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### Year 1 Semester II

### SEMESTER END EXAMINATION

### Principles of Management – MAGT0361

- This paper consists of EIGHT questions on THREE (03) pages.
- Answer FIVE 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: 2022.09.25          Pass mark: 50%          Time: 03 Hours

## Question 01: (Compulsory)

"Developments in the general environment (Macroenvironment) can shape the task environment (Microenvironment)". Explain how below listed factors/ forces impact a business using examples.

   a) Economic
   b) Social Cultural
   c) Competitors
   d) Suppliers

(20 Marks)

## Question 02

a) What is planning? Argue importance of planning function for an organization.

(10 Marks)

b) Explain the three major types of corporate strategies.          (10 Marks)

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## Question 03

a) List three (03) common traditional organizational structure? Explain two (02) types with examples                                                        (10 Marks)
b) What is "Selection" in Human Resource Management Process? Explain two (02) tools/ methods that could be used for selecting the correct candidate for the organization.                                                                 (10 Marks)

## Question 04

a) Using one of the early motivation theories, explain how companies could motivate employees for high level of performance.                          (10 Marks)
b) "Specific goals increase performance and difficult goals, when accepted, result in higher performance than do easy goals". Explain how goals can be a motivator using goal setting theory.                                               (10 Marks)

## Question 05

a) What is controlling? Discuss why controlling function is important to an organization?                                                           (12 Marks)
b) What is organizational performance? Discuss two measures of organizational performance                                                            (08 Marks)

## Question 06
Explain following terms.
   a) Programmed Decision
   b) Risk (Condition)
   c) Self-Managed work teams
   d) Work Group

(05 Marks * 4 = 20 Marks)

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## Question 07

a) Like it or not, change happens and despite the potential positive outcomes, change is often resisted at both the individual and the organisational level. Discuss why an individual in an organization resist to change.                    (12 Marks)

b) List 8 tools that could be used for communicating with employees in such situation.                    (08 Marks)

## Question 08

Compare and contrast the learnings under a selected behavioral theory and a contingency theory of leadership.                    (20 Marks)

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

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### Year 1 Semester II

### SEMESTER END EXAMINATION

### Basic Knowledge in Engineering – ENGK0381

- This paper consists of EIGHT questions on THREE (03) pages.
- Answer FIVE 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: 2022.09.22               Pass mark: 50%               Time: 03 Hours

## Question 01 (Compulsory)

a) What is the purpose of MARPOL 73/78 ANNEXES?               (04 Marks)

b) What are the MARPOL 73/78 ANNEXES?               (10 Marks)

c) What is the maximum allowable oil content of bilge water to be discharge overboard from machinery spaces?               (02 Marks)

d) What is the purpose of Sewage treatment plant?               (04 Marks)

## Question 02

a) Sketch a refrigeration cycle and name the main components (clearly show the direction of refrigerant flow and H. P. & L. P. sides)               (08 Marks)

b) Briefly explain the function of main components of the refrigeration system.

(08 Marks)

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c) Name 3 I.M.O. recommended primary refrigerants.                    (04 Marks)

## Question 03

a) Draw a block diagram of a ships steering gear system and mark major components.
                                                                       (10 Marks)

b) What is "hunting gear" of the steering gear system?                (05 Marks)

c) What is the function of Telemotor Transmitter?                     (05 Marks)

## Question 04

a) Write 5 types of pumps used on board ships and mention the purpose of they are used?                                                              (10 Marks)

b) What are the 2 basic categories of pumps used on board ships?      (02 Marks)

c) Briefly explain how centrifugal pump works.                        (08 Marks)

## Question 05

a) What are the 2 basic types of boilers?                             (02 Marks)

b) Name 5 boiler mountings.                                           (05 Marks)

c) What is the purpose of boiler safety valve?                        (05 Marks)

d) What is the purpose of water level gauge glass?                    (05 Marks)

e) What is a composite boiler?                                        (03 Marks)

## Question 06

Briefly describe the main purpose of following equipment used on board ships.

a) Fresh water generator                                             (04 Marks)

b) Hatch covers                                                      (04 Marks)

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c) Air compressors                                          (04 Marks)

d) Heavy fuel oil purifier                                   (04 Marks)

e) Anchor windless                                          (04 Marks)

## Question 07

a) What are the uses of following things on board ships?

i) Steam                                                    (05 Marks)

ii) Compressed air                                          (05 Marks)

iii) Fresh water                                            (05 Marks)

b) What is the equipment used to store compressed air on board ships?   (02 Marks)

c) What is the purpose of oily water separator?             (03 Marks)

## Question 08

a) What is Internal Combustion (I.C.) engine?              (4 Marks)

b) What is the main difference between 4-stroke & 2-stroke engine?   (4 Marks)

c) What are the 4 events (strokes) taking place in I.C. engine?   (4 Marks)

d) What are the important elements for combustion in marine fuel oils?   (4 Marks)

e) Mention 2 uses of medium speed engines.                 (4 Marks)

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

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## Year 1 Semester II

## SEMESTER END EXAMINATION

## English for Business II – ENGL10308

- This paper consists of FIVE questions on TWELVE (12) pages.
- Answer ALL Questions.
- 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: 2022.09.20          Pass mark: 50%          Time: 03 Hours

---

### Section A – Business Vocabulary/ Structures

### Question 1

**A. Write the most appropriate word given within brackets in answer sheet (10 marks)**

(i). The [supplementary/ complementary/ fringe] benefits include free health insurance.

(ii). The people arrested claimed that they were political refugees, not [affluent/ economic/ transitory] migrants.

(iii). Most small cars are very [economical/ sophisticated/ outdated] to run.

(iv). Our strategy is risk [maximization/ minimization/ optimization], not risk taking.

(v). It's the industry which keeps our national economy [operated/ going/ moving].

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(vi). The government devalued the currency to try to revive the [flagging/ losing/ changing] economy.

(vii). The black economy [stands/ booms/ disappears] when there is high unemployment.

(viii). Investors want an immediate [income/fund/ return] on their capital.

(ix). [Liquidized/ Liquid/ Liquidity] assets can be sold very quickly.

(x). More tax [obligations/ responsibilities/ liabilities] are likely to minimize company's income.

**B. Complete the sentences putting the words in the second part in the correct order. (10 marks)**

(i). The research philosophy is the foundation of any study as it ......................

..............................................................................................

[beliefs/ upon which/ is/ the/ the/ of/ set/ describes/ built/ research]

(ii). Experimental research involves manipulating ......................................

..............................................................................................

[dependent/ independent/ a/ the/ the/ change/ variable/ observe/ variable/ to/ in]

(iii). A case study is a detailed study of a single subject ...................................

..............................................................................................

[an in-depth/gain/ context/ the/ the/ study/ of/ to/ understanding/ within]

(iv). A longitudinal time horizon for data collection refers to ..........................

..............................................................................................

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[period/ collection/ an/ extended/the/ data/ of/ repeatedly/ over]

(v). Quantitative is predominantly used as a synonym for ...............................

.................................................................................................................

[numerical data/ that/any data/ generates/ technique/ uses/ collection/or]

## Section B – English in Pragmatic/ Realistic Settings

### Question 2

**A. Identify the errors in the following sentences and rewrite correcting them. (10 marks)**

**Example:** There isn't some work.

There isn't *any* work.

(i). Everybody have completed an internship. .......................................

(ii). He was accused of plagiarism, no? .................................................

(iii). Statistics are a useful subject. ........................................................

(iv). You haven't been abroad, no? ........................................................

(v). The manager praised him because he works hardly. .............................

(vi). The event is held annually every year. .............................................

(vii). The manager hasn't yet come to office. ...........................................

(viii). You couldn't go there, didn't you? ...............................................

(ix). Your dissertation has many mistakes. ..............................................

(x). I think he is senior than you. ..........................................................

## B. Write the functions of the following expressions used in everyday language

### choosing from the box. (10 marks)

certainty, obligation, permission, suggestion, ability, prohibition, no necessity, criticism, assumption, possibility, ~~request~~

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*Example:* Could you help me with my dissertation? *[request]*

(i). Can you invest in the new project?

................................

(ii). Next year the new company may have a bigger share of the market.

................................

(iii). Could we possibly stay at your flat?

................................

(iv). Intoxicating liquor cannot be sold to persons under 18.

................................

(v). A company's business model must take into consideration social, economic and environmental factors.

................................

(vi). Some state corporations didn't have to go through customs.

................................

(vii). The HR Manager should have deposited EPF and ETF on time.

................................

(viii). The tall well-dressed gentleman should be the CEO.

................................

(ix). The management can't have made a wrong decision.

................................

(x). Shall we shift our main warehouse next year?

................................

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## Section C – Comprehension

## Question 3

I.   **Read the following instruction given about the use of auxiliary verbs and fill in the blank accurately with an auxiliary verb or verbs. (05 marks)**

To avoid repeating words from a previous clause or sentence we use an auxiliary verb such as be, have or modals instead of a whole verb group or instead of a verb and what follows it. If there is more than one auxiliary verb in the previous clause or sentence, we leave out all the auxiliary verbs except the first instead of repeating the main verb. Alternatively, we can use two or more auxiliary verbs.

"I'm not quite sure whether Mrs. Ruwanthi had been invited to the party, although her husband ...................................................................."

II.  **Read the advantages of Cork bottle stoppers and fill in the given blanks. (05 marks)**

The classic cork stopper does have several advantages, however. Firstly, its traditional image is more in keeping with that of the type of high quality goods with which it has long been associated. Secondly, and very importantly, cork is a sustainable product that can be recycled without difficulty. Moreover, cork forests are a resource which support local biodiversity and prevent desertification in the regions where they are planted.

Cork suits the (i)........................... of quality products

It is made from a (ii).......................... material.

It is easily (iii).............................

Cork forests aid (iv)..........................

Cork forests stop  (v)....................................

III. **Read the following passage and write in the blanks 'Yes' if the given statements agree with the claims of the writer, 'No' if the statement**

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contradicts the claims of the writer. 'Not given' if it is impossible to think
what the writer thinks about this. (10 marks)

After a number of serious failures of governance (that is how they are managed
at the highest level), companies in Britain, as well as elsewhere, should
consider radical changes to their directors' roles. It is clear that the role of a
board director is not an easy one. Following a financial breakdown in 2008,
which resulted in a deeper and more prolonged period of economic downturn
that anyone expected, the search for explanations in the many post mortems of
the crisis has meant blame has been spread far and wide. Governments,
regulators, central banks and auditors have all been in the frame. The role of
bank directors and management and their widely publicized failures have been
extensively picked over and examined in reports, inquiries and commentaries.

Often, board business is devolved to committees in order to cope with the
workload, which may be more efficient but can mean that the board as a whole
is less involved in fully addressing some of the most important issues. It is not
uncommon for the audit committee meeting to last longer than the main board
meeting itself. Process may take the place of discussion and be at the expense
of real collaboration, so that boxes are ticked rather than issues tackled.

(i). It is suggested that directors' roles need not undergo through and
complete changes everywhere. ...........................

(ii). Continued economic downturn after financial breakdown in 2008 was
hardly expected. ......................

(iii). In addition to government regulators, central banks and auditors, even
the retailers were among the blamed in the frame. ..........................

(iv). Not only reports but also inquiries and commentaries reveal the failures
of the work of bank directors and management. ......................

(v). Some responsibilities of the board business have been transferred to a
committee structure to enhance efficiency. ..........................

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### Section D – Presenting Information

### Question 4

**A. Correct the underlined errors in the following description of a bar graph and write in the given blanks. Chocolate consumption – in kilos per head in 2018. (10 marks)**

| Country | Kilos per head female | Kilos per head male | Total kilos per head |
|---|---|---|---|
| Switzerland | 5.0 | 5.3 | 10.3 |
| Australia | 2.2 | 2.2 | 4.4 |
| Sri Lanka | 0.5 | 0.4 | 0.9 |

The table provides information on how much chocolate ***were consuming*** (i)................. in a range of different countries in the world. It ***is shown*** (ii)................. the number of kilos per head ***were eating*** (iii)..................... in 2018 and provides a breakdown of these figures for men and women.

Total chocolate consumption ranges from 0.9 to 10.3 kilos per head. The country with the ***most high*** (iv)..................... consumption of chocolate is Switzerland, where an average of 10.3 kilos ***consuming*** (v)................... per person. In other countries, we do not see a similar ***consumed*** (vi)................... pattern. By contrast, Sri Lankans ate ***a lesser*** (vii)...................... amount of chocolate.

As far as consumption of men and women is concerned, there is generally little ***different*** (viii)...................... between the two. In most cases, women eat almost the same amount of chocolate as men. An equal number of men and women ***would eat*** (ix)........... chocolate during the period under consideration.

Overall, it seems that very different quantities of chocolate are eaten around the world but in general, the product is ***best*** (x)................... popular in Europe than elsewhere.

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**B. Summarize the information given in the table by selecting and reporting the main features and make comparisons where relevant. (10 marks)**

The table gives information on the ages of the population of Yemen and Italy in 2000 and projections for 2050.

| Year | Yemen | | | Italy | | |
|------|-------|-------|-------|-------|-------|-------|
| | 0-14 years | 15-59 years | 60 + years | 0-14 years | 15-59 years | 60 + years |
| 2020 | 50.1% | 46.3% | 3.6% | 14.3% | 61.6% | 24.1% |
| 2050 | 37.0% | 57.3% | 5.7% | 11.5% | 46.2% | 42.2% |

Write at least 100 words.

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## Section E – Business Writing

### Question 5

**A. In the conclusion of the following report, ten phrases or sentences are missing.**

**Write the number of the missing phrases or clauses given separately in the blanks where they should fit in. (10 marks)**

The careful and thorough study of the behavior, working atmosphere and *e.g. (iv)* working at restaurants in the Colombo metropolitan area implies that essential and integral components of the rewarding system expected for Caffee Bravo should include *(a)...............* for working hours as a crucial extrinsic factor to retain the employees and a flexible leave plan without *(b)............* as an intrinsic motivational factor.

The employees working in the restaurant networks in Colombo *(c)............*. Only a minority of youth living in Colombo and its suburbs work in restaurants. Further, there is a quite a number of leading restaurants in Colombo and even *(d)............* them to join another in the immediate vicinity. Thus, for Caffee Bravo to keep employees attracted, implementing *(e)............* with fringe benefits is indispensable.

The targeted employees for Caffee Bravo are mostly *(f)...........* and generally studied up to G.C.E (O/L) in the country. So their aspirations are comparatively low and lack commitment for long term career success. In addition, *(g)...........* and expect lenient rules to enjoy life. Due to this life style, when they are not given freedom and ample leave, once they leave for villages after a period of work, they don't usually return to work. *(h)...........* by most restaurant owners in the country.

Therefore, it is recommended for Caffee Bravo to have an eight-hour shifts for the employees with a competitive hourly payment and making the employees aware that *(i)...........* They can even exchange shifts with their colleague employees. While maintaining a friendly working atmosphere with encouraging remarks and rewards, a weekly *(j)...........* for the three outlets in Colombo.

(i). a little dissatisfaction may compel

(ii). any hard and fast rules

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(iii). the youth qualified in the hotel schools

*(iv). the aspirations of the employees e.g.*

(v). It is common issue faced

(vi). a competitively higher hourly payment in the industry

(vii). are mostly outstation

(viii). scheduled work plan is recommended

(ix). the suggested reward system

(x). the dreams of the majority in this group are simple

(xi). they have a flexible leave system.

B. **You work as secretary to a director of an advertising agency. The board has decided**

**to outsource some of the agency's IT work and you have been asked to look at possible contractors to do this work and prepare a proposal. Write the proposal for outsourcing using the information and the notes given below. (10 marks)**

AdDirect, Colombo 07 (note: quite expensive)

- Set up, maintain and update company websites (note: would save money because.....)
- data systems security and 199 emergency telephone hotline (note: didn't have this facility last year because.......)
- installation and maintenance of communication systems

Techno Excela, Malabe – We provide (note: cheaper but ....)

- online IT support and training (note: too late! Staff given this last year, so ..)
- website hosting (note: But we need web design)
- tailored programs supplied and installed

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**Use the following format:**

Introduction – AdDirect- Techno Excela - Recommendations

**Write at least 150 words.**

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

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## Year 1 Semester II

## SEMESTER END EXAMINATION

## English for Business II – ENGL10308

- This paper consists of FIVE questions on TWELVE (12) pages.
- Answer ALL Questions.
- 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: 2022.09.20          Pass mark: 50%          Time: 03 Hours

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### Section A – Business Vocabulary/ Structures

### Question 1

**A. Write the most appropriate word given within brackets in answer sheet (10 marks)**

   (i). The [supplementary/ complementary/ fringe] benefits include free health insurance.

   (ii). The people arrested claimed that they were political refugees, not [affluent/ economic/ transitory] migrants.

   (iii). Most small cars are very [economical/ sophisticated/ outdated] to run.

   (iv). Our strategy is risk [maximization/ minimization/ optimization], not risk taking.

   (v). It's the industry which keeps our national economy [operated/ going/ moving].

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(vi). The government devalued the currency to try to revive the [flagging/ losing/ changing] economy.

(vii). The black economy [stands/ booms/disappears] when there is high unemployment.

(viii). Investors want an immediate [income/fund/ return] on their capital.

(ix). [Liquidized/ Liquid/ Liquidity] assets can be sold very quickly.

(x). More tax [obligations/ responsibilities/ liabilities] are likely to minimize company's income.

**B. Complete the sentences putting the words in the second part in the correct order. (10 marks)**

(i). The research philosophy is the foundation of any study as it .....................
.........................................................................................................
[beliefs/ upon which/ is/ the/ the/ of/ set/ describes/ built/ research]

(ii). Experimental research involves manipulating ........................................
.........................................................................................................
[dependent/ independent/ a/ the/ the/ change/ variable/ observe/ variable/ to/ in]

(iii). A case study is a detailed study of a single subject ...................................
.........................................................................................................
[an in-depth/gain/ context/ the/ the/ study/ of/ to/ understanding/ within]

(iv). A longitudinal time horizon for data collection refers to ............................
.........................................................................................................

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[period/ collection/ an/ extended/the/ data/ of/ repeatedly/ over]

(v). Quantitative is predominantly used as a synonym for .................................

.............................................................................................................

[numerical data/ that/any data/ generates/ technique/ uses/ collection/or]

## Section B – English in Pragmatic/ Realistic Settings

### Question 2

**A. Identify the errors in the following sentences and rewrite correcting them. (10 marks)**

> **Example:** There isn't some work.
>
> There isn't *any* work.

(i). Everybody have completed an internship. ......................................

(ii). He was accused of plagiarism, no? ...............................................

(iii). Statistics are a useful subject. ....................................................

(iv). You haven't been abroad, no? ....................................................

(v). The manager praised him because he works hardly. .............................

(vi). The event is held annually every year. ...........................................

(vii). The manager hasn't yet come to office. ........................................

(viii). You couldn't go there, didn't you? .............................................

(ix). Your dissertation has many mistakes. ...........................................

(x). I think he is senior than you. ......................................................

**B. Write the functions of the following expressions used in everyday language choosing from the box. (10 marks)**

> certainty, obligation, permission, suggestion, ability, prohibition, no necessity, criticism, assumption, possibility, ~~request~~

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*Example:* Could you help me with my dissertation? *[request]*

(i). Can you invest in the new project?

.....................................

(ii). Next year the new company may have a bigger share of the market.

.....................................

(iii). Could we possibly stay at your flat?

.....................................

(iv). Intoxicating liquor cannot be sold to persons under 18.

.....................................

(v). A company's business model must take into consideration social, economic and environmental factors.

.....................................

(vi). Some state corporations didn't have to go through customs.

.....................................

(vii). The HR Manager should have deposited EPF and ETF on time.

.....................................

(viii). The tall well-dressed gentleman should be the CEO.

.....................................

(ix). The management can't have made a wrong decision.

.....................................

(x). Shall we shift our main warehouse next year?

.....................................

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## Section C – Comprehension

## Question 3

I.   **Read the following instruction given about the use of auxiliary verbs and fill in the blank accurately with an auxiliary verb or verbs. (05 marks)**

To avoid repeating words from a previous clause or sentence we use an auxiliary verb such as be, have or modals instead of a whole verb group or instead of a verb and what follows it. If there is more than one auxiliary verb in the previous clause or sentence, we leave out all the auxiliary verbs except the first instead of repeating the main verb. Alternatively, we can use two or more auxiliary verbs.

"I'm not quite sure whether Mrs. Ruwanthi had been invited to the party, although her husband ............................................................................"

II.  **Read the advantages of Cork bottle stoppers and fill in the given blanks. (05 marks)**

The classic cork stopper does have several advantages, however. Firstly, its traditional image is more in keeping with that of the type of high quality goods with which it has long been associated. Secondly, and very importantly, cork is a sustainable product that can be recycled without difficulty. Moreover, cork forests are a resource which support local biodiversity and prevent desertification in the regions where they are planted.

Cork suits the (i)............................ of quality products
It is made from a (ii)............................ material.
It is easily (iii)............................
Cork forests aid (iv)............................
Cork forests stop (v)............................

III. **Read the following passage and write in the blanks 'Yes' if the given statements agree with the claims of the writer, 'No' if the statement**

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**contradicts the claims of the writer. 'Not given' if it is impossible to think what the writer thinks about this. (10 marks)**

After a number of serious failures of governance (that is how they are managed at the highest level), companies in Britain, as well as elsewhere, should consider radical changes to their directors' roles. It is clear that the role of a board director is not an easy one. Following a financial breakdown in 2008, which resulted in a deeper and more prolonged period of economic downturn that anyone expected, the search for explanations in the many post mortems of the crisis has meant blame has been spread far and wide. Governments, regulators, central banks and auditors have all been in the frame. The role of bank directors and management and their widely publicized failures have been extensively picked over and examined in reports, inquiries and commentaries.

Often, board business is devolved to committees in order to cope with the workload, which may be more efficient but can mean that the board as a whole is less involved in fully addressing some of the most important issues. It is not uncommon for the audit committee meeting to last longer than the main board meeting itself. Process may take the place of discussion and be at the expense of real collaboration, so that boxes are ticked rather than issues tackled.

(i). It is suggested that directors' roles need not undergo through and complete changes everywhere. ...........................

(ii). Continued economic downturn after financial breakdown in 2008 was hardly expected. ......................

(iii). In addition to government regulators, central banks and auditors, even the retailers were among the blamed in the frame. ...........................

(iv). Not only reports but also inquiries and commentaries reveal the failures of the work of bank directors and management. ......................

(v). Some responsibilities of the board business have been transferred to a committee structure to enhance efficiency. ...........................

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## Section D – Presenting Information

### Question 4

**A. Correct the underlined errors in the following description of a bar graph and write in the given blanks. Chocolate consumption – in kilos per head in 2018. (10 marks)**

| Country | Kilos per head female | Kilos per head male | Total kilos per head |
|---|---|---|---|
| Switzerland | 5.0 | 5.3 | 10.3 |
| Australia | 2.2 | 2.2 | 4.4 |
| Sri Lanka | 0.5 | 0.4 | 0.9 |

The table provides information on how much chocolate ***were consuming*** (i)................... in a range of different countries in the world. It ***is shown*** (ii)................. the number of kilos per head ***were eating*** (iii)..................... in 2018 and provides a breakdown of these figures for men and women.

Total chocolate consumption ranges from 0.9 to 10.3 kilos per head. The country with the ***most high*** (iv)..................... consumption of chocolate is Switzerland, where an average of 10.3 kilos ***consuming*** (v)................... per person. In other countries, we do not see a similar ***consumed*** (vi)................... pattern. By contrast, Sri Lankans ate ***a lesser*** (vii)..................... amount of chocolate.

As far as consumption of men and women is concerned, there is generally little ***different*** (viii)..................... between the two. In most cases, women eat almost the same amount of chocolate as men. An equal number of men and women ***would eat*** (ix)........... chocolate during the period under consideration.

Overall, it seems that very different quantities of chocolate are eaten around the world but in general, the product is ***best*** (x)................... popular in Europe than elsewhere.

**B. Summarize the information given in the table by selecting and reporting the main features and make comparisons where relevant. (10 marks)**

The table gives information on the ages of the population of Yemen and Italy in 2000 and projections for 2050.

| Year | Yemen | | | Italy | | |
|---|---|---|---|---|---|---|
| | 0-14 years | 15-59 years | 60 + years | 0-14 years | 15-59 years | 60 + years |
| 2020 | 50.1% | 46.3% | 3.6% | 14.3% | 61.6% | 24.1% |
| 2050 | 37.0% | 57.3% | 5.7% | 11.5% | 46.2% | 42.2% |

Write at least 100 words.

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## Section E – Business Writing

## Question 5

**A. In the conclusion of the following report, ten phrases or sentences are missing.**

**Write the number of the missing phrases or clauses given separately in the blanks where they should fit in. (10 marks)**

The careful and thorough study of the behavior, working atmosphere and *e.g. (iv)* working at restaurants in the Colombo metropolitan area implies that essential and integral components of the rewarding system expected for Caffee Bravo should include *(a)*.............. for working hours as a crucial extrinsic factor to retain the employees and a flexible leave plan without *(b)*............ as an intrinsic motivational factor.

The employees working in the restaurant networks in Colombo *(c)*............. Only a minority of youth living in Colombo and its suburbs work in restaurants. Further, there is a quite a number of leading restaurants in Colombo and even *(d)*............ them to join another in the immediate vicinity. Thus, for Caffee Bravo to keep employees attracted, implementing *(e)*............ with fringe benefits is indispensable.

The targeted employees for Caffee Bravo are mostly *(f)*........... and generally studied up to G.C.E (O/L) in the country. So their aspirations are comparatively low and lack commitment for long term career success. In addition, *(g)*........... and expect lenient rules to enjoy life. Due to this life style, when they are not given freedom and ample leave, once they leave for villages after a period of work, they don't usually return to work. *(h)*........... by most restaurant owners in the country.

Therefore, it is recommended for Caffee Bravo to have an eight-hour shifts for the employees with a competitive hourly payment and making the employees aware that *(i)*........... They can even exchange shifts with their colleague employees. While maintaining a friendly working atmosphere with encouraging remarks and rewards, a weekly *(j)*........... for the three outlets in Colombo.

(i). a little dissatisfaction may compel

(ii). any hard and fast rules

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(iii). the youth qualified in the hotel schools

*(iv). the aspirations of the employees e.g.*

(v). It is common issue faced

(vi). a competitively higher hourly payment in the industry

(vii). are mostly outstation

(viii). scheduled work plan is recommended

(ix). the suggested reward system

(x). the dreams of the majority in this group are simple

(xi). they have a flexible leave system.

B. **You work as secretary to a director of an advertising agency. The board has decided to outsource some of the agency's IT work and you have been asked to look at possible contractors to do this work and prepare a proposal. Write the proposal for outsourcing using the information and the notes given below. (10 marks)**

AdDirect, Colombo 07 (note: quite expensive)

- Set up, maintain and update company websites (note: would save money because….)
- data systems security and 199 emergency telephone hotline (note: didn't have this facility last year because…….)
- installation and maintenance of communication systems

Techno Excela, Malabe – We provide (note: cheaper but ….)

- online IT support and training (note: too late! Staff given this last year, so ..)
- website hosting (note: But we need web design)
- tailored programs supplied and installed

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**Use the following format:**

Introduction – AdDirect- Techno Excela -  Recommendations

**Write at least 150 words.**

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

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### Year 1 Semester II

### SEMESTER END EXAMINATION

### Mathematics for Business II – MATH0379

- This paper consists of EIGHT questions on NINE (09) pages.
- Answer FIVE 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: 2022.09.18          Pass mark: 50%          Time: 03 Hours

---

## Question 01 (Compulsory)

(a) Write the truth set of the given predicate $P(x) = x + 7 < 12$ where the domain is the natural number set.                                         (02 Marks)

(b) A biscuit company manufactures two types of biscuits, Star Snacks and Lemon chips. The cost for one Star Snacks packet is Rs. 150 and cost for one Lemon chips packet is Rs. 50. Market demand for both biscuits is at most 75 per week. If the company wants to determine the best product mix by minimizing the cost of manufacturing, determine the decision variables, <u>and</u> write the objective function.

(02 Marks)

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(c) Write the number of edges in a complete graph with 6 nodes. (02 Marks)

(d) Determine the step size ($h$) to find the integral $\int_1^6 x^3 + 1 \, dx$ by applying Trapezoidal Rule if the number of equal strips is 10. (02 Marks)

(e) Is differential equation, $2\frac{d^2y}{dx^2} + 3\frac{dy}{dx} + 4y = 3e^x$ homogenous? State reasons for your answer. (02 Marks)

(f) Given that $U = \{1,2,3,4,5,6,7\}$, $p = x \text{ is even}$ and $q = x \text{ is less than } 4$, find the truth sets of $p \wedge q$ and $\sim p \vee q$. (02 Marks)

(g) Which of the following 3 graphs are bipartite? State with reasons/ illustrations.



A         B         C

(02 Marks)

(h) Write the auxiliary equation of $6\frac{d^2y}{dx^2} + 8y = 3x + 4$. (02 Marks)

(i) What it is meant by 'feasible solution' in a Linear Programming Problem. Explain in your own words. (02 Marks)

(j) Calculate the definite integral $\int_{-1}^1 x^3 + 3x - 2 \, dx$. (02 Marks)

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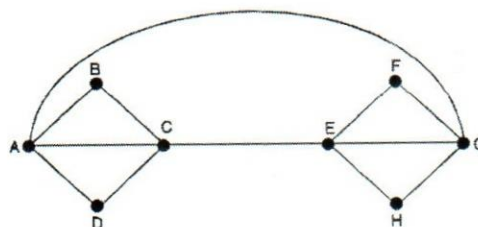
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## Question 02

(a) A firm produces three products. These products are processed on three different machines. The time required to manufacture one unit of each of the three products and the daily capacity of the three machines are given in the Table 1 below:

Table 1

| Machine | Production Time per unit (Minutes) | | | Machine Capacity (minutes per day) |
|---|---|---|---|---|
| | Product 1 | Product 2 | Product 3 | |
| $M_1$ | 2 | 4 | 2 | 460 |
| $M_2$ | 5 | - | 6 | 490 |
| $M_3$ | 3 | 4 | - | 420 |

It is required to determine the daily number of units to be manufactured for each product. The profit per unit for product 1, 2 and 3 is Rs.4.00, Rs.5.00 and Rs.6.00 respectively. It is assumed that all the amounts produced are consumed in the market. Formulate the Linear Programming Model that will maximize the daily profit. (Do not solve) (10 Marks)

(b) Consider the differential equation $\frac{d^2y}{dx^2} - 6\frac{dy}{dx} + 8y = 0$.

(i) Find the general solution of the differential equation. (06 Marks)

(ii) Find the particular solution when $y(0) = -2$ and $y'(0) = 6$. (04 Marks)
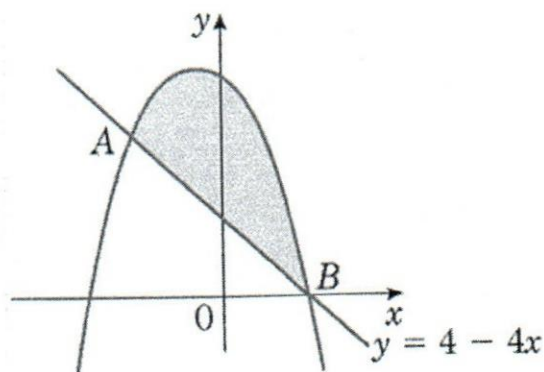
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## Question 03

(a) Use Figure 1 to answer the questions below.
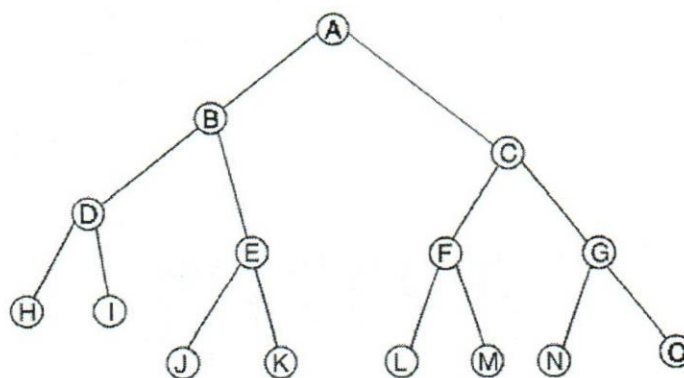


Figure 1

| | |
|---|---|
| (i)  Name the root and the number of leaves of the tree. | (02 Marks) |
| (ii) Name the siblings of node B and G. | (02 Marks) |
| (iii) What are the descendants of B and F? | (02 Marks) |
| (iv) What are the levels of node E and N? | (02 Marks) |
| (v) Write the height of the tree. | (02 Marks) |
| (vi) Is this a complete binary tree? State reasons for your answer. | (02 Marks) |

(b) Construct a truth table for the given logical statement and comment whether it is a tautology, contradiction, or neither.

$$p \lor (q \land r) \to (p \land r) \lor q$$

(08 Marks)

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## Question 04

(a) A company manufactures two products A and B. Both products are processed on two machines $M_1$ & $M_2$.

Table 2: Details about Machine hour utilization for each product

|  | $M_1$ | $M_2$ |
|---|---|---|
| A | 6Hrs/Unit | 2Hrs/Unit |
| B | 4Hrs/Unit | 4Hrs/Unit |
| Maximum availability of machine hours per month | 7200 Hrs/month | 4000 Hrs/month |

Profit per unit for A is Rs. 100 and for B is Rs. 80. Company wants to know the best monthly product mix to maximize the profit.

(i) Develop the LP Model for the given problem. (06 Marks)

(ii) Find out the monthly production of A and B to maximise profit by graphical method. (08 Marks)

(b) Use the Trapezoidal rule to approximate the integral $\int_0^1 f(x)dx$ where a table of values for the function $f(x)$ is given in Table 3. (06 Marks)

Table 3

| x | 0 | 0.25 | 0.5 | 0.75 | 1 |
|---|---|---|---|---|---|
| f(x) | 2.5 | 1.2 | 1.75 | 2.25 | 3.5 |

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## Question 05

(a) The diagram in Figure 2 shows the line $y = x - 1$ meeting the curve with equation
with equation $y = (x - 1)(x - 5)$ at A and C. The curve meeting the x-axis at A
and B.
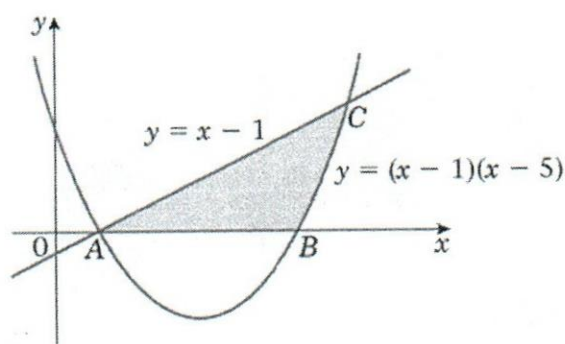


Figure 2

   (i)   Write down the coordinates of A and B and find the coordinates of C.

(05 Marks)

   (ii)  Find the area of the shaded region bounded by the line, the curve and the
x-axis.                                                  (05 Marks)

(b) Write the negations of the given statements.

    (i)      For any prime number $x$, the number $x + 1 > 4$.        (02 Marks)

    (ii)    There exists an integer $k$ such that $2k + 1$ is even.    (02 Marks)

    (iii)  $\forall x \in \mathbb{N}, x - 7 \le 5$                                         (02 Marks)

(c) Write the truth table for the below logical statement.       (04 Marks)

$$(\sim p \wedge q) \vee (p \wedge \sim q)$$

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## Question 06

(a) Use the <u>graphical method</u> to solve the following LP problem.     (12 Marks)

$$Maximize\ Z\ =\ 15x_1\ +\ 10x_2$$

$$subject\ to$$

$$4x_1\ +\ 6x_2\ \le\ 360$$

$$3x_1\ \le\ 180$$

$$5x_2\ \le\ 200$$

$$x_1, x_2\ \ge\ 0$$

(b) Consider the given second order non-homogeneous differential equation with constant coefficients.

$$\frac{d^2y}{dx^2} - 2\frac{dy}{dx} - 8y = e^{2t}.$$

(i) Write the auxiliary equation and find the complementary function.  (03 Marks)

(ii)     Find the particular Integral.     (04 Marks)

(iii)    Write the general solution to the differential equation.     (01 Mark)

## Question 07

(a) Use Figure 3 below to answer following questions.



Figure 3

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(i)   Write two trails from A to F with two different lengths. Mention the length of each trail.                                                                    (04 Marks)

(ii)  What is the difference between circuits and cycles?                         (02 Marks)

(iii) Name a cycle with length 6.                                                (02 Marks)

(iv)  Is the given graph complete? Give reasons to your answer.                   (03 Marks)

(v)   Draw the complement graph of the given graph above.                         (03 Marks)

(b) The diagram in following figure (Figure 4) shows a sketch of part of the curve with equation $y = 9 - 3x - 5x^2 - x^3$ and the line with equation $y = 4 - 4x$. The line cuts the curve at the points $A \equiv (-1, 8)$ and $B \equiv (1, 0)$.

Find the <u>area of the shaded region</u> between AB and curve.                   (06 Marks)



Figure 4

## Question 08

(a) A diet for a sick person must contain at least 4,000 units of vitamins, 50 units of minerals and 1,400 calories. Two foods A and B are available at a cost of Rs. 4 and Rs. 3 per unit, respectively. If one unit of A contains 200 units of vitamins, 1 unit of mineral and 40 calories and one unit of food B contains 100 units of vitamins, 2 units of minerals and 40 calories. Formulate this problem as an LP model to find combination of foods to be used to have least cost? (Do not solve.)                (10 Marks)

(b) Classify the given linear partial differential equations as elliptic, parabolic or hyperbolic.

   (i)   $2U_{xx} + 6U_{xt} + 4U_{tt} - 6U_t = 0$                (02 Marks)

   (ii)   $2L_{yt} - 4L_{yy} - L_t = 0$                (02 Marks)

   (iii) $F_{xx} + F_{yy} = 0$                (02 Marks)

(c) Show that $\sim(P \to Q) \equiv P \wedge \sim Q$.                (04 Marks)

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

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### Year 1 Semester II

### SEMESTER END EXAMINATION

### Macroeconomics – ECON0317

- This paper consists of EIGHT questions on SIX (06) pages.
- Answer FIVE 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: 2022.09.15      Pass mark: 50%      Time: 03 Hours

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## Question 01 (Compulsory)

Below is the ideas of Dr. W.A. Wijewardena given to a Newspaper regarding current economic situation of the country.

"The current economic status of Sri Lanka is disastrous. From every front in the economy, Sri Lanka has been hit. Economic growth is in the negative range. There is a drastic reduction in food production due to the impractical organic farming policy implemented by the former government. The Government budget is in danger with a huge reduction in revenue, about 4% of GDP, ballooning of the budget deficit from 6% of GDP to over 12%, and the Government's resort has been to borrow from the banking system – Rs. 3.7 trillion during the 27-month period from January 2020.

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The increase in the money stock, which people refer to as money printing, has been Rs. 4 trillion or 52%. As a result, inflation is galloping – now at 30%, according to official sources, but at 151% according to inflation tracker Steve Hanke of Johns Hopkins University."

Critically analyze the current economic status of the country, especially focusing on major macroeconomic variables. (20 marks)

## Question 02

Fill in the blanks using most relevant economics terms.

a) The expenditure approach is the sum of all purchases in the categories of consumption, _____ , government expenses and net exports on final goods and services for a given period.

b) _____ is defined as the value of all final goods and services produced in a country in a period of time, almost always one year.

c) Factor payments include _____ for the use of labor services _____ for land, _____ payments for the use of capital goods, and _____ for entrepreneurs, who put labor, land, and capital together.

d) _____ must be subtracted from gross domestic product to get net national product.

e) The liquidity preference theory was introduced by _____ .

f) Transaction demand for money is not influenced by _____ rate.

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g) The alternating periods of expansion and contraction in economic activities are known as ——————————— .

h) When there is rise in the price due to excess of demand, it is termed as ————— Inflation.

i) The portion of bank deposits that a bank must keep on reserve are known as

_____.

j) Under expansionary monitory policy by open market operations, Central Bank _____ treasury bills in the secondary market in order to inject liquidity to the market.

k) Under contractionary monitory policy by open market operations, Central Bank _____ treasury bills in the secondary market in order to reduce liquidity in the market.

l) The _____ of a country formulates and operates the monetary policy.

m) The main objective of the monetary policy is economic growth with—————————.

n) _____ and _____ rates provide a lower bound and upper bound respectively, to call rates.

o) Phillips curve is a historical inverse relationship between _____and _____ in an economy.

(20 marks)

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## Question 03

a) Using the given data calculate the GDP at market prices under output approach.
   (all the values are in Rupees Bn.)                                      (04 marks)

| Value added in Services sector | 1500 |
|---|---|
| Value added in Industry | 800 |
| Value added in Agriculture | 2700 |
| Factor income receipts | 200 |
| Factor income payments | 50 |
| Indirect taxes | 1000 |
| Subsidies | 500 |
| Depreciation | 20 |
| Net exports | 1000 |
| Government expenses | 200 |

b) What is the difference between open economy and closed economy?   (02 mark)

c) Distinguish between final goods and intermediate goods. Why are intermediate goods not included in gross domestic product of a country?   (04 marks)

d) The circular flow model shows that firms and households are both buyers and sellers simultaneously. How is this possible?   (02 marks)

e) Use the simple circular flow model to show the circular flow income and explain the equivalence between factor income flow, household expenditure flow and the value of output flow.   (08 marks)

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## Question 04

a) Define unemployment and explain how it is differs from underemployment.

(03 marks)

b) In an economy with a labour force of 27.3 million people and 3.1 million unemployed people, what is the unemployment rate? (02 marks)

c) Explain why unemployment figures are not usually accurate. (05 marks)

d) Explain the social and economic consequences of unemployment. (10 marks)

## Question 05

a) What are the instruments of monetary policy? Explain the role of changes in statutory rate ratio and open market operations in controlling inflation.

(10 marks)

b) Inflation results in redistribution of purchasing power. Explain who is likely to gain and who is likely to lose from the redistribution effects of inflation.

(06 marks)

c) What are the negative consequences of inflation other than redistribution?

(04 marks)

## Question 06

a) Distinguish between Microeconomics and Macroeconomics. (05 marks)

b) Following information are provided for a 4-sector economy. Values are indicated in Rs. Millions.

Consumption= 60+0.9Yd
Investment=10
Government expenditure=10
Tax=0

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Exports=20
Imports=10+0.05Y

| | | |
|---|---|---|
| i. | Calculate the equilibrium income. | (08 marks) |
| ii. | Calculate the trade balance (X-M). | (02 marks) |
| iii. | How much is the savings? | (03 marks) |
| iv. | How much is the imports? | (02 marks) |

## Question 07

Explain whether you accept with the statement that "government should intervene less aggressively as countries grow and develop and more strongly in countries that are relatively lower level of economic growth."                        (20 marks)

## Question 08

Select any four and write short notes.                        (04*05 marks=20 marks)

a) Philips curve

b) Say's Law

c) Currency Board System

d) Interest rate corridor

e) Liquidity Preference Theory

f) Business Cycles

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

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### Year 1 Semester II
### SEMESTER END EXAMINATION
### Business Statistics – STAT0367

- This paper consists of EIGHT (08) questions on TWELVE (12) pages.
- Answer <u>FIVE (05)</u> 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.
- Areas under Standard Normal Curve are attached.

Date: 2022.09.13          Pass mark: 50%          Time: 03 Hours

---

## Question 01 (Compulsory)

Select the most suitable answer for the following MCQ questions

1. Which of the following statements are true?
   a. Categorization of social classes as upper class, middle class and lower class is an example for nominal scale
   b. The main difference between ordinal scale and interval scales is that the interval scale uses unit of measurements
   c. The class interval in a frequency distribution is an example for interval scale.

   A. a. only
   B. b. only
   C. c. only
   D. a. and b. only
   E. a., b. and c.

2. fresh milk packet is old at the prices of LKR 60, LKR 100, LKR 120 and LKR 150per liter in four consecutive different months respectively. If a family spent

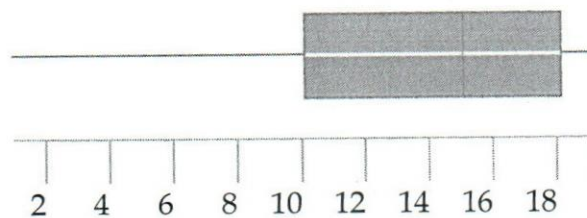![CINEC CAMPUS logo] **CINEC**
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LKR 600 on milk per month in the four months, find the average price (LKR) per liter of fresh milk for the family per month.

    A. LKR 96
    B. LKR 107.50
    C. LKR 102
    D. LKR 120
    E. LKR 150

3. Geometric mean of 10 observations on a certain variable is calculated as 15.7. later it was found that the observed value 21 had been taken as 12 in calculation. What is the corrected geometric mean value?

    A. $15.7(1.75)$
    B. $15.7(0.57)$
    C. $15.7(0.57)^{1/10}$
    D. $15.7(1.75)^{1/10}$
    E. $(15.7)*(1.75)^{10}$

4. V(X) of variable is X is 7. What is the variance of 3X

    A. 7
    B. 21
    C. 63
    D. 3
    E. 147

5. In a group there are 3 boys and 2 girls. If 3 are selected at random from this group, find the probability that there are 2 boys and 1 girl and 1 boy and 2 girls.

    A. 1/5
    B. 3/10
    C. ½
    D. 3/5
    E. 9/10

6. Suppose A and B are two independent events. The probability that both A and B occur is 1/8 and the probability that neither of them occur 3/8. If $P(A) > P(B)$, what is the value P(A)?

    A. 3/8
    B. ½
    C. 1/8

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    D. $\frac{1}{4}$

    E. $\frac{3}{4}$

7. Suppose that A and B are any two events. $P(A \cap B) = P(A \cap B') = P(A' \cap B) = k$. what is the probability that at least one event occurs from the events A and B?

    A. 3k

    B. 2k

    C. k

    D. $3k^2$

    E. $k^2$

Question no 8,9 and 10 are based on the following description.

A student sit for a test consists of 10 multiple choice questions with 5 answers to each question. Only one correct answer is there. The student answers each question by selecting one answer randomly as the correct answer. To pass the exam the student needs to get 60% correct answers.

8. What is the suitable probability distribution to model the number of correct answers provided by the student?

    A. Poisson Distribution

    B. Hypergeometric Distribution

    C. Binomial Distribution

    D. Negative Binomial Distribution

    E. Geometric distribution

9. What is the probability that student pass the exam

    A. 0.0544

    B. 0.0328

    C. 0.0064

    D. 0.9991

    E. 0.9936

10. What is the probability that student get less than 40 marks?

    A. 0.9936

    B. 0.8863

    C. 0.8598

    D. 0.8791

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E. 0.9672

11. The scale applied in statistics which imparts a difference of magnitude and proportions is considered as;

A. Ordinal Scale

B. Nominal Scale

C. Interval Scale

D. Ratio Scale

E. Exponential Scale

12. The mean of an examination is 69, the median is 68, the mode is 67, and the standard deviation is 3. The measures of variation for this examination is:

    A. 3
    B. 68
    C. 67
    D. 69
    E. 9

13. Which of the following is not an example of a discrete probability distribution?

    A. The sale price of a house
    B. The number of bedrooms in a house
    C. Number of children in a family
    D. Numbers of members in a household
    E. Number of bathrooms in a house

14. Which of the following is not a correct statement about a probability.

    A. It must have a value between 0 and 1
    B. It can be reported as a decimal or a fraction
    C. A value near 0 means that the event is not likely to occur/happens
    D. It is the collection of several experiments
    E. Probability of a particular event can be 1.

15. In a Poisson probability distribution

    A. The mean and standard deviation of the distribution are the same (equal)

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B. The mean and variance of the distribution are the same (equal)

C. The probability of success is always greater than 5

D. The number of trials is always less than 5

E. It always contains a contingency table

16. Consider the boxplot below.



Which of the following statements are true?

I. The distribution is skewed left.
II. The interquartile range is about 8.
III. The median is about 10.

A. I only
B. II only
C. III only
D. I and II
E. II and III

17. A simple random sample consists of four observations: {1, 3, 5, 7}. Based on these sample observations, what is the best estimate of the standard deviation of the population?

A. 2
B. 2.58
C. 6
D. 6.67
E. 3

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18. A population consists of four observations: {1, 3, 5, 7}. What is the variance?
    A. 2
    B. 4
    C. 5
    D. 6
    E. 3

19. If E(X) = 2, what is the value of E(3X +2)
    A. 2
    B. 8
    C. 6
    D. 4
    E. 5

20. If V(X) = 3, what is the value of V(3X + 2)?
    A. 11
    B. 9
    C. 29
    D. 27
    E. 20

(20 Marks)

## Question 02

(a) State whether the following statements are true or false and explain your answer.
(12 Marks)
   (i) Classification of students by their graduating class, First class, Second upper, second lower and General pass is an example for interval scale.
   (ii) Qualitative variables can be categorized under interval scale
   (iii) Arithmatic operations like division and multiplication are not valid for Interval scale variables.

(b) State the most appropriate data collection method/s for each of the following studies. Describe how each method is applied giving one advantage and one disadvantage. (04 Marks)

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(i) standard deviation
(j) Coefficient of variation

(20 Marks)

## Question 04

(a) State which of the following can be modelled with a Binomial Distribution and
which cannot. Give reasons for your answers.                    (09 Marks)
   (i) Given that 15% of people have blood that is Rhesus negative (Rh⁻), model
       the number of undergraduates in a class of 14 who are Rh⁻
   (ii) Keep tossing a fair coin until obtain 4 head in succession. Model the
        number of tosses needed.
   (iii) A certain car manufacturer produces 12% of new cars in the colour red,
         8% in blue, 15% in white and the rest in other colours. You make a note of
         the colours of the first 15 new cars of this brand. Model the number of red
         cars you observe.

(b) A factory produces a component and manufacturer claims that the 5% of the
components are defective. A quality control officer regularly inspects a random
sample of 50 components. Find the probability that the next sample of size 50
contains,
   (i) Fewer than 2 defectives                                   (03 Marks)
   (ii) More than 5 defectives                                   (04 Marks)
The officer will stop production if the number of defectives in the sample is
greater than 2 defectives.
   (iii) Find the probability of stop production.                (04 Marks)

## Question 05

(a) State which of the following could e modelled by a Poisson distribution, and
which can not. Justify your answer.                             (06 Marks)
   (i) Number of accidents per week at a certain road.
   (ii) The number of marathon runners passing the finishing post between 20
        and 21 minutes after the winner of the race.
   (iii) The amount of salt (in mg) contained 1cm³ of water taken from a bucket
         immediately after a teaspoon of salt was added to the bucket.

(b) A biologist is studying the behaviour of sheep in a large field. The field is divided into number of equally sized squares and average number of sheep per square is 2.5. The sheep is randomly scattered throughout the field.

  (i) Suggest a suitable to model the number of sheep in a square.

  (01 Marks)

  (ii) Write the parameter/s of the identified distribution          (01 Marks)

  (iii) Calculate the probability that, randomly selected square contains more than 3 sheep.          (04 Marks)

  (iv) Calculate the probability that, randomly selected square contains fewer than 5 sheep.          (04 Marks)

  (v) If a sheep dog has been sent into the field to round up the sheep. Explain why the distribution suggest part (a) is no longer be applicable.

  (04 Marks)

## Question 06

Boxes of chocolates are produced with a mean weight 510g. quality control officer claims that 1% of boxes are rejected because their weight is less than 485g.

  (a) Find the standard deviation of the weight of a box of chocolates.     (10 Marks)

  (b) Using the above standard deviation value calculated above find the probability that,          (10 Marks)

    (i)  Boxes that weight more than 525g
    (ii) Boxes that weight in between 485g and 525g.

## Question 07

  (a) A and B are two events. $P(A) = 0.6$, $P(B) = 0.7$, and $P(A \cup B) = 0.9$

    (i)   Find $P(A \cap B)$
    (ii)  $P(A')$
    (iii) $P(A' \cup B)$
    (iv)  $P(A' \cap B)$

  (08 Marks)

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(b) *Pet We Care* is a animal hospital survey 100 of their clients. Results are given below.

- 25 own dogs
- 15 own dogs and cats
- 11 own dogs and tropical fish
- 53 own cats
- 10 own cats and tropical fish
- 7 own dogs, cats and tropical fish
- 40 own tropical fish

a client is chosen at random,

(i) Draw a Venn diagram to represent the above information.

find the probability that the client,

(ii) Own dogs only
(iii) Does not own tropical fish
(iv) Does not own dogs, cats or tropical fish.

(08 Marks)

(c) A and B are two events such that $P(A) = 0.6$, $P(B) = 0.5$, $P(A \cap B) = 0.4$, find,

(i) $P(A \cup B)$
(ii) $P(B \mid A)$
(iii) $P(A \mid B)$
(iv) $P(A \mid B')$

(04 Marks)

## Question 08

(a) For each of the following situations, suggest the most suitable Data source for the study. If suggested method is the Secondary Data Source, Identify the author of the suggested secondary data source. (10 Marks)

(i) A Researcher is interested in forecasting the Import, Export and Transshipment container throughput of the Colombo Port.

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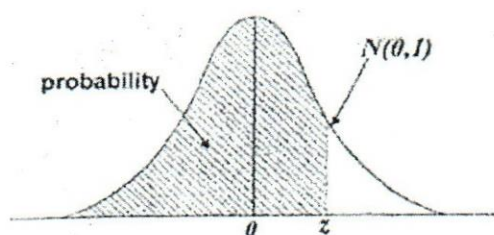Course CODE: COM550

(ii) A researcher is interested in factors influenced in undergraduate students to select their subject stream

(iii) A researcher is interested in studying Labour Force of Sri Lanka

(iv) A researcher is interested in studying road accidents of Sri Lanka

(v) A medical practitioner is interested in studying Chronic Kidney Disease in North Central Province in Sri Lanka.

(b) In each of the following situations, explain what graphical display you would use to present the information most appropriately. Do a sketch of the display highlighting the important aspects that should be considered in those graphs.

(i) Student Coordinator of the Faculty of Management at CINEC Campus should present the number of students recruited for the Logistics Degree programme for the period of 2012 to 2022. (02 Marks)

(ii) Student Coordinator of the Faculty of Management at CINEC Campus needs to present, the number of male and female students eligible for the undergraduate programme from each of the streams: Mathematics, Bio-Sciences, Commerce and Arts. (04 Marks)

(iii) Course Coordinator of the Faculty of Management at CINEC Campus needs to compare marks obtained by first year undergraduate students for Mathematics and Business English modules.

(04 Marks)

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

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## The Standardised Normal Distribution Table



probability — $N(0,1)$

The distribution tabulated is that of the normal distribution with mean **zero** and standard deviation **1**. For each value of $Z$, the standardized normal deviate, (the proportion $P$, of the distribution less than $Z$) is given. For a normal distribution with mean $\mu$ and variance $\sigma^2$ the proportion of the distribution less than some particular value $X$ is obtained by calculating $Z = (X - \mu)/\sigma$ and reading the proportion corresponding to this value of $Z$.

| Z | P | Z | P | Z | P |
|---|---|---|---|---|---|
| -4.00 | 0.00003 | -1.00 | 0.1587 | 1.05 | 0.8531 |
| -3.50 | 0.00023 | -0.95 | 0.1711 | 1.10 | 0.8643 |
| -3.00 | 0.0014 | -0.90 | 0.1841 | 1.15 | 0.8749 |
| -2.95 | 0.0016 | -0.85 | 0.1977 | 1.20 | 0.8849 |
| -2.90 | 0.0019 | -0.80 | 0.2119 | 1.25 | 0.8944 |
| -2.85 | 0.0022 | -0.75 | 0.2266 | 1.30 | 0.9032 |
| -2.80 | 0.0026 | -0.70 | 0.2420 | 1.35 | 0.9115 |
| -2.75 | 0.0030 | -0.65 | 0.2578 | 1.40 | 0.9192 |
| -2.70 | 0.0035 | -0.60 | 0.2743 | 1.45 | 0.9265 |
| -2.65 | 0.0040 | -0.55 | 0.2912 | 1.50 | 0.9332 |
| -2.60 | 0.0047 | -0.50 | 0.3085 | 1.55 | 0.9394 |
| -2.55 | 0.0054 | -0.45 | 0.3264 | 1.60 | 0.9452 |
| -2.50 | 0.0062 | -0.40 | 0.3446 | 1.65 | 0.9505 |
| -2.45 | 0.0071 | -0.35 | 0.3632 | 1.70 | 0.9554 |
| -2.40 | 0.0082 | -0.30 | 0.3821 | 1.75 | 0.9599 |
| -2.35 | 0.0094 | -0.25 | 0.4013 | 1.80 | 0.9641 |
| -2.30 | 0.0107 | -0.20 | 0.4207 | 1.85 | 0.9678 |
| -2.25 | 0.0122 | -0.15 | 0.4404 | 1.90 | 0.9713 |
| -2.20 | 0.0139 | -0.10 | 0.4602 | 1.95 | 0.9744 |
| -2.15 | 0.0158 | -0.05 | 0.4801 | 2.00 | 0.9772 |
| -2.10 | 0.0179 | 0.00 | 0.5000 | 2.05 | 0.9798 |
| -2.05 | 0.0202 | 0.05 | 0.5199 | 2.10 | 0.9821 |
| -2.00 | 0.0228 | 0.10 | 0.5398 | 2.15 | 0.9842 |
| -1.95 | 0.0256 | 0.15 | 0.5596 | 2.20 | 0.9861 |
| -1.90 | 0.0287 | 0.20 | 0.5793 | 2.25 | 0.9878 |
| -1.85 | 0.0322 | 0.25 | 0.5987 | 2.30 | 0.9893 |
| -1.80 | 0.0359 | 0.30 | 0.6179 | 2.35 | 0.9906 |
| -1.75 | 0.0401 | 0.35 | 0.6368 | 2.40 | 0.9918 |
| -1.70 | 0.0446 | 0.40 | 0.6554 | 2.45 | 0.9929 |
| -1.65 | 0.0495 | 0.45 | 0.6736 | 2.50 | 0.9938 |
| -1.60 | 0.0548 | 0.50 | 0.6915 | 2.55 | 0.9946 |
| -1.55 | 0.0606 | 0.55 | 0.7088 | 2.60 | 0.9953 |
| -1.50 | 0.0668 | 0.60 | 0.7257 | 2.65 | 0.9960 |
| -1.45 | 0.0735 | 0.65 | 0.7422 | 2.70 | 0.9965 |
| -1.40 | 0.0808 | 0.70 | 0.7580 | 2.75 | 0.9970 |
| -1.35 | 0.0885 | 0.75 | 0.7734 | 2.80 | 0.9974 |
| -1.30 | 0.0968 | 0.80 | 0.7881 | 2.85 | 0.9978 |
| -1.25 | 0.1056 | 0.85 | 0.8023 | 2.90 | 0.9981 |
| -1.20 | 0.1151 | 0.90 | 0.8159 | 2.95 | 0.9984 |
| -1.15 | 0.1251 | 0.95 | 0.8289 | 3.00 | 0.9986 |
| -1.10 | 0.1357 | 1.00 | 0.8413 | 3.50 | 0.99977 |
| -1.05 | 0.1469 | | | 4.00 | 0.99997 |

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### Year 1 Semester I

### REPEAT EXAMINATION

### Mathematics for Business I – MATH0377

- This paper consists of EIGHT questions on EIGHT (08) pages.
- Answer FIVE 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: 2022.08.17             Pass mark: 50%             Time: 03 Hours

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## Question 01 (Compulsory)

For the questions 1-10 choose the correct answer.             (2 Marks each)

1. Choose the correct statement.

    (a) $3 + 2i \in \mathbb{R}$

    (b) $\frac{5}{3} \in \mathbb{Z}$

    (c) $3e + 2 \in \mathbb{C}$

    (d) $\sqrt{2} + \sqrt{3} \in \mathbb{R}$

    (e) $-1 \in \mathbb{N}$

2. What can you say about the nature of the roots of $4x^2 - 2x + 3 = 0$?

    (a) It has two distinct real roots.

    (b) It has one repeated root.

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(c) It has no roots.

(d) It has no real roots.

(e) It has three roots.

3. The solution set of $|5x - 2| < 18$ is,

   (a) $-\frac{16}{5} < x < 4$

   (b) $-\frac{16}{5} \leq x \leq \frac{16}{5}$

   (c) $-4 \leq x \leq 4$

   (d) $-\frac{16}{5} \leq x \leq 4$

   (e) $-4 < x < 4$

4. Choose the correct expression.

   (a) $\log_2 \frac{1}{32} = 5$

   (b) $\log_{10} 0.01 = 2$

   (c) $\log_4 64 = 3$

   (d) $\ln\left(\sqrt[8]{e}\right) = 8$

   (e) $2\ln(e^6) = 6$

5. Let $f(x) = e^x \ln\left(\frac{x}{6}\right)$. Then $f'(x)$ is,

   (a) $\ln\left(\frac{x}{6}\right) e^x + \frac{1}{x}$

   (b) $e^x \left[\frac{1}{x} + \ln\left(\frac{x}{6}\right)\right]$

   (c) $e^x \left[\frac{6}{x} + \ln\left(\frac{x}{6}\right)\right]$

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(d) $e^x \left[ \frac{1}{6x} + \ln \left( \frac{x}{6} \right) \right]$

(e) None of the above.

6. $\left( \frac{3x^5 y^4}{x^0 y^{-3}} \right)^2$ can be simplified to get

(a) $9x^{25} y^{18}$     (b) $9x^{10}$     (c) $3x^{10} y^{36}$     (d) $9x^{25} y^{36}$     (e) $9x^{10} y^{14}$

7. $\lim\limits_{x \to -3} \frac{\sqrt{4x+28}-4}{x+3}$ gives an indeterminate form when direct substitution is used.

Which of the following answers states the next step that you can apply and the

limit value after applying that step?

a) Factorization and cancellation, 2

b) Rationalization using conjugates, ½

c) Alternate forms of trigonometric functions, 4

d) Rationalization using conjugates, -2

e) Factorization and cancellation, ½

8. Let $f(x) = x^5 - 3x^3 + 2x^2 - 2x - 1$. Find $f'(x)$.

(a) $\frac{x^5}{5} + \frac{3x^4}{4} + \frac{2x^3}{3} - x^2 - x + C$

(b) $12x^3 + 18x^2 + 8x - 2$

(c) $\frac{x^5}{5} + \frac{3x^4}{4} + \frac{2x^3}{3} - x^2 - x + C$

(d) $5x^4 - 9x^2 + 4x - 2$

(e) None of the above

9. Let $f(x) = 2x - 3$ and $g(x) = 2x^2$. If $h = f \circ g$ then $h(1)$ is,

(a)   -2                (b) 2                (c)  1                (d) -1                (e) 3

10. Determine the domain of $g(x) = x^3 + \frac{6}{\sqrt{x}} - \frac{1}{\sqrt{x-7}}$.

(a)  $x \in \mathbb{R} \setminus \{0,7\}$

(b)  $7 \le x < \infty$

(c)  $7 < x < \infty$

(d) $0 \le x < \infty$

(e)  None of the above

(20 Marks)

## Question 02

(a)   Let $A = \begin{pmatrix} 6 & 4 & -3 \\ 2 & 5 & 1 \\ -2 & 0 & 9 \end{pmatrix}$.

Show that $A + A^T$ is a symmetric matrix.                (06 Marks)

(b)   Write following logarithmic equations as exponential equations.
(i)        $\log_3 9 = 2$
(ii)       $\log_2 8 = 3$

(04 Marks)

(c)   Find $x$ in $\log_4 x = 2$.                (03 Marks)

(d)   Given that $\begin{vmatrix} 2 & -3 & 1 \\ 2 & 0 & -1 \\ 1 & 4 & 5 \end{vmatrix} = x^2$, find $x$.

Hint: Start by calculating the determinant of given matrix.        (07 Marks)

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## Question 03

(a) Let $A = \begin{pmatrix} 3 & -5 \\ -4 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} -3 & 1 & 1 \\ 0 & 4 & 0 \end{pmatrix}$. Calculate $A \cdot B$ if possible. (05 Marks)

(b) Evaluate $\int_4^{12} \frac{2}{\sqrt{x}} dx$, giving your answer in the form $a + b\sqrt{3}$, where $a$ and $b$ are

integers. (05 Marks)

(c) Solve the differential equation $\frac{dy}{dx} = xe^{2y}$. (05 Marks)

(d) Calculate $\lim_{x \to 2} x^3 + 2x^2 - 3x + 5$. (05 Marks)

## Question 04

(a) Evaluate $\int x^2 \ln x \, dx$ using integration by parts. (06 Marks)

(b) Let $A = \begin{pmatrix} 5 & 4 & -1 \\ 2 & 1 & 2 \\ 6 & -3 & 1 \end{pmatrix}$ and $B = \begin{pmatrix} 2 & 1 & 2 \\ 5 & 4 & -1 \\ 12 & -6 & 2 \end{pmatrix}$

(i) Given that $2A + C = B$, find C. (03 Marks)

(ii) Find $A^2$. (03 Marks)

(iii) Calculate $|A|$. (03 Marks)

(iv) Hence determine the $|B|$ without calculations and give reasons for your

answer. (02 Marks)

(v) Use necessary calculations to prove the answer obtained in (iv).

(03 Marks)

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## Question 05

(a)  Let $f(x) = 3x^2 + 5x - 2$.

(i)  Determine the nature of roots using the discriminant of $f(x)$.  (02 Marks)

(ii)  Determine the roots of $f(x)$ by factorizing <u>or</u> using any other method.

(02 Marks)

(iii)  Find the coordinates of the points where the graph of $f$ intersects the $x$-axis.

(02 Marks)

(iv)  Find the $y$-intercept of the graph of $f$.  (02 Marks)

(v)  Find the coordinates of the vertex.  (03 Marks)

(vi)  Sketch the graph of $f(x)$ using the results you obtained in (b), (c), (d) and (e).

(03 Marks)

(vii) Determine the domain and the range of $f(x)$, using the graph obtained in (f).

(02 Marks)

(viii)  Explain <u>two</u> methods to determine the solution set of $3x^2 + 5x - 2 < 0$.

(04 Marks)

## Question 06

(a) Solve the given system using Cramer's Rule.  (12 Marks)

$$3x + y - z = 3$$
$$x + y + z = 1$$
$$x - 2y - 3z = 4$$

(b) Let $f(x) = \frac{x-2}{1-\sqrt{3x-5}}$, $g(x) = 5x^2 - 9$, $h(x) = 4x^3 + 2x$

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(i) Show that when $\lim_{x \to 2} f(x)$ gives an indeterminate form when direct

substitution is used. (02 Marks)

(ii) Evaluate $\lim_{x \to 2} f(x)$ by writing an equivalent form of $f(x)$. (03 Marks)

(iii) Evaluate $\lim_{x \to -2} g(x) \cdot h(x)$. (03 Marks)

## Question 07

(a) Given that $A$ is a constant and $\int_1^4 (6\sqrt{x} - A)dx = A^2$, show that there are two

possible values for $A$ and find these values. (06 Marks)

(b) Given $A = \{2, 4, 6, 8, 10, 12, 14\}$ and $B = \{4, 8, 12\}$. Using <u>necessary calculations</u>,

<u>show</u> that following statements are <u>true.</u>

(i)    $\mathcal{P}(B)$ has 8 elements. (03 Marks)

(ii)   $B \subset A$ (03 Marks)

(iii)  $A \cup B = A$ (02 Marks)

(iv)   $A \cap B = B$ (02 Marks)

(c) Find $x$ and $B$, if $B = \begin{pmatrix} 4 & x+2 \\ 2x-3 & x+1 \end{pmatrix}$ is symmetric. (04 Marks)

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## Question 08

(a) Find $\int_{-2}^{6} f(x)\, dx$ if $\int_{4}^{-2} f(x)\, dx = -2$ and $\int_{6}^{4} f(x)\, dx = 5$.               (03 Marks)

(b) Given that $p(x) = e^{2x}$ and $q(x) = 3\ln(5x)$

    (i)    Obtain $r(x) = p(x) + q(x)$.               (03 Marks)

    (ii)   Find $r'(x)$.               (03 Marks)

    (iii)  Show that $r''(x) = 4e^{2x} - \dfrac{3}{x^2}$.               (02 Marks)

    (iv)  Evaluate $\dfrac{d}{dx}\big(p(x) \cdot q(x)\big)$.               (03 Marks)

(c)    Solve $4(2x - 6) + 4x \leq 2$ and display the solution set in a real number line.

               (06 Marks)

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

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## Year 1 Semester II

## REPEAT EXAMINATION

## Transport Geography – TGEO0302

- This paper consists of EIGHT questions on FOUR (04) pages.
- Answer FIVE 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: 2022.06.12          Pass mark: 50%          Time: 03 Hours

---

## Question 01 (Compulsory)

**"The main purpose of transportation is to overcome space".**

(a) Explain in your own words how geography poses a significant threat to the

transportation?                                                    (06 Marks)

(b) Mention and explain the three major constraints of space that transportation has

to overcome.                                                       (06 Marks)

(c) Describe with an example in the modern day, how the transportation has
overcome physical environment with technology.

(08 Marks)

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## Question 02

(a) Distinguish between relative and absolute barriers with examples.

(06 Marks)

(b) Mention and explain the two major processes that intensify global interactions together with transport. (08 Marks)

(c) Mention and briefly explain three key elements in a transportation network.

(06 Marks)

## Question 03

"Unit Delivery" is a newly formulated parcel delivery company and they aim to deliver parcels to any part of the world within a time frame of 24 hours. However, the owner of Unit Delivery company doesn't have a clear idea about the types of transport network structures.

(a) As a student learning Transport Geography module, mention and explain the most suitable network structure for the above scenario by highlighting the benefits of using the mentioned network structure. (10 Marks)

(b) Mention and explain the two major dimensions that spatial organization relies on. (04 Marks)

(c) Name three transportations infrastructure and the constraints that they possess.

(06 Marks)

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## Question 04

a) What's the centrality and intermediacy function of a transportation terminal?

(04 Marks)

b) What're the major attributes linked with the performance of a transportations terminal?

(04 Marks)

c) What's an inland port?

(04 Marks)

d) Explain the type of intermodal terminals.

(08 Marks)

## Question 05

(a) Explain two locational influence of transportation          (06 Marks)

(b) What are the global scales of spatial organization for Transportation?

(06 Marks)

(c) What are the 4 major elements that define a port site? Explain

(08 Marks)

## Question 06

(a) "Containerized transportation substantially changed port dynamics". Explain in your own words.          (05 Marks)

(b) Distinguish between Monofunctional and Polyfunctional terminals. (06 Marks)

(c) Briefly explain the factors that impact the airport traffic.          (09 Marks)

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## Question 07

a) What's urbanization? What are the three major demographic trends that drives
urbanization? (05 Marks)
b) Explain the vicious cycle of congestion. (06 Marks)
c) Explain how the two concepts called "**Urban Sprawl**" and "**Transportation**" are
related to each other. (06 Marks)
d) Name three major issues in urban transportation. (03 Marks)

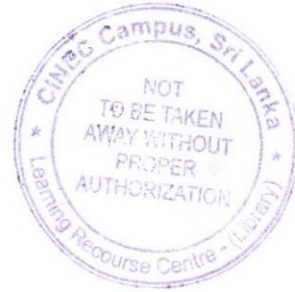## Question 08

Write short notes on the below topics. (04 * 05 Marks)

(a) Congestion.
(b) Pendulum movements.
(c) City Logistics.
(d) Manufacturing districts

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

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### Year 1 Semester II

### REPEAT EXAMINATION

### Macroeconomics – ECON0317

- This paper consists of EIGHT questions on SIX (06) pages.
- Answer FIVE 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: 2022.06.11      Pass mark: 50%      Time: 03 Hours

## Question 01

The paragraph below was extracted from the CNN news, which explains the current economic situation of Sri Lanka.

"Experts say the crisis of Sri Lanka has been years in the making, driven by a little bad luck and a lot of government mismanagement. Over the past decade, the Sri Lankan government has borrowed vast sums of money from foreign lenders to fund public services. This borrowing has coincided with a series of disappointments to the Sri Lankan economy, from both natural disasters -- such as heavy monsoons -- to man-made catastrophes, including a government ban on chemical fertilizers that decimated farmers' harvests."

a) According to the above paragraph, analyze the current economic situation of the country.

**(Total marks 20)**

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## Question 02

Fill in the blanks

a) The fact that money can be immediately used in exchange, whereas valuable jewelry cannot, illustrates the fact that money is very_____.

b) The measure of the money supply that includes currency of commercial bank and public, deposits with the Central Bank and deposits of other institutions with the Central Bank is called _____.

c) The portion of bank deposits that a bank must keep on reserve are known as

_____.

d) The portion of bank reserves that banks are permitted to lend or invest are known as _____.

e) The rate at which the Central Bank provides credit to commercial banks_____.

f) _____ and _____ rates provide a lower bound and upper bound respectively, to call rates.

g) Under expansionary monitory policy by open market operations, Central Bank _____ treasury bills in the the secondary market in order to inject liquidity to the market.

h) Under contractionary monitory policy by open market operations, Central Bank _____ treasury bills in the secondary market in order to reduce liquidity in the market.

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i) The theory that assumes that the velocity of money is constant in the equation $M \times V = P \times Y$ is the _____.

j) The three motives to hold money are _____, _____. _____.

k) The two primary functions of a commercial bank are _____, _____.

l) In a commercial bank balance sheet the bank's _____are its sources of funds and _____ are its uses of funds.

m) At the start of the twenty-first century, Zimbabwe experienced _____ inflation so that economists had difficulty measuring it.

n) Phillips curve is a historical inverse relationship between _____and _____ in an economy.

**(Total Marks 20)**

## Question 03

a) Assume a closed economy with government which suffers from the lack of business confidence. As a result, private investment does not rise, nor does it respond to the changes in interest rate. The government keeps spending to compensate for lack of private spending. But after a change in government business confidence was restored, private investment begins to rise and becomes highly sensitive to changes in interest rate. Analyze the economic impact of this change. If this change is accompanied by a monetary expansion, then how does your answer change? **(10 marks)**

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b) Central Bank of Sri Lanka is using different types of instruments under its monetary management as quantitative and qualitative credit controls. What are they? Explain. (10 marks)

**(Total Marks 20)**

## Question 04

a) A set of macroeconomic data relating to a hypothetical economy is set out below (values are in Rs. Billion)

| | |
|---|---|
| Salaries and wages | 300 |
| Personal income tax | 270 |
| Interest income | 100 |
| Government transfer payments | 250 |
| Corporate profit taxes | 20 |
| Undistributed company profit | 10 |
| Net income earned from self-employment | 30 |
| Net foreign primary income earnings | 30 |

i.    Calculate the National Income (04 marks)
ii.   Calculate the Disposable Household Income (04 marks)

b)    List down the three approaches to measuring national income. (02 marks)
c)    Distinguish between Macroeconomics and Microeconomics (10 Marks)

**(Total Marks 20)**

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## Question 05

Following information are provided for a 3-sector economy. Values are indicated in Rs. Millions.

$$C = 1200 + 0.75yd$$

$$T = 400 + 0.2y$$

$$I = 2500$$

$$G = 1600$$

a) Calculate equilibrium income (value of output) of the economy algebraically.

(08 marks)

b) The function $C = C_0 + C_i Y$ is used to calculate the amount of total consumption in an economy. Where C is consumption expenditure and Y is national income.

    i.   What is $C_0$ and $C_i$?                                          (02 marks)

c) Briefly explain
    i.   Net National Product (NNP)
    ii.  Gross Domestic Product (GDP)                                      (02 marks)

d) The income-consumption schedule of a hypothetical economy has given as below.

| National Income (Rs. Million) | Consumption (Rs. Million) |
| --- | --- |
| 200 | 160 |
| 300 | 230 |

    i.   Derive the consumption function of this economy
    ii.  Derive the savings function of this economy                       (08 marks)

**(Total Marks 20)**

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## Question 06

a) Using graphs explain demand pull and cost push inflation.     (10 marks)

b) Discuss the two types of disequilibrium unemployment. Use diagrams in your answers.     (10 marks)

**(Total Marks 20)**

## Question 07

a) Explain how changes in Statutory Reserve Requirement (SRR) is controlling money supply of an economy. Explain using an example.     (05 marks)

b) Explain the sources and uses of a commercial bank.     (05 marks)

c) What is the role of a Commercial Bank in the Economic Development of a Country?     (10 marks)

**(Total Marks 20)**

## Question 08

Select any four and write short notes.     (5 marks per each)

i.    Monetary policy and Fiscal policy.

ii.   Interest rate corridor

iii.  Credit creation by commercial banks.

iv.   Functions of the Central Bank of Sri Lanka

v.    Open Market Operations

vi.   Liquidity Preference Theory

**(Total Marks 20)**

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

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### Year 1 Semester II

### REPEAT EXAMINATION

### Principles of Management – MAGT0361

- This paper consists of EIGHT questions on THREE (03) pages.
- Answer FIVE 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: 2021.10.08          Pass mark: 50%          Time: 03 Hours

---

## Question 01: (Compulsory)

The factors and forces outside the organization that affect the organization performance are called external environmental forces. List five factors/ forces in the external environment. Explain how three of the listed factors/ forces impact a business using examples.          (20 Marks)

## Question 02

a) Define the term planning in management.          (05 Marks)
b) "Well-stated objectives are SMART". State an example.          (05 Marks)
c) Explain why organization need to change using examples.          (10Marks)

## Question 03

a)   Describe two types of corporate strategies using examples.          (08 Marks)
b)   Explain **three** of following terms.
   I.   Authority
   II.   Responsibility
   III.   Unity of command

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IV.     Span of control

(12 Marks)

## Question 04

Write short notes on any four (4) of the following topics.
a) Kurt Lewin's Leadership Styles
b) Blake Mouton Managerial (Leadership) Grid
c) Hersey and Blanchard's Situational Leadership Theory
d) Goal-setting theory
e) Herzberg's Two-Factor Theory
f) Maslow's hierarchy of needs

(20 Marks)

## Question 05

a)     Explain the nature and importance of control.          (08 Marks)
b)     Describe the three steps in the control process.       (12 Marks)

## Question 06

a) List three essential skills of a manager and explain one out of them.     (04 Marks)
b) Explain the two types of problems and decisions that a manager might face.

(16 Marks)

## Question 07

a) Explain the importance of Human Resource Management (HRM) for an organization.

(10 Marks)
b) Through HR planning, organizations avoid sudden people shortages and surpluses.
   Explain two main components (Steps) of HR planning.          (10 Marks)

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## Question 08

a) Discuss two main factors that affect group performance and satisfaction using examples.                                                                                   (08 Marks)

b) Explain how communication can flow most effectively in organizations.

(12 Marks)

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

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## Year 1 Semester II
## SEMESTER END EXAMINATION
### Business Statistics – STAT0367

- This paper consists of EIGHT (08) questions on TWELVE (12) pages.
- Answer <u>FIVE (05)</u> 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.
- Areas under Standard Normal Curve are attached.

Date: 2020.09.28             Pass mark: 50%             Time: 03 Hours

---

## Question 01 - Compulsory
Underline the correct answer and attached question paper to the Answer Book

(20 Marks)

1) Dermatologist is checked the effectiveness of his acne control cream by recommending the cream for 10 patients. If acne cream is effective for nine or more than 09 patients, he will recommend this treatment for his patient who are coming to tear acnes. Lets X is the number of patients who comments that acne cream is effective. What is the distribution of the random variable X?
   - A.    Uniform distribution
   - B.    Binomial distribution
   - C.    Poisson distribution
   - D.    Negative Binomial Distribution

2) Which of the following statements are true?
   - I.    Categorical variables are the same as qualitative variables.
   - II.    Quantitative variables cannot be discrete.
   - III.    Quantitative variables can be continuous variables.

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A. I Only
B. II Only
C. III Only
D. I and III
E. I and II

3) When a uni-modal distribution is symmetric, the highest point if the curve is called the

A.    Mean
B.    Median
C.    Mode
D.    All of the above

4) The sum of the deviations taken from Arithmetic Mean is

A.    1
B.    m
C.    zero
D.    n

5) The possible outcome of an experiment is called the,

A.    Random experiment
B.    Event
C.    Sample space
D.    Subset

6) A measure computed from sample data is called

A.    Statistics
B.    Statistic
C.    Data
D.    Parameter

7) When all the values in a series occur the same number of times, then it is not possible to compute the………….

A.    Mean
B.    Median
C.    Standard Deviation
D.    Mode

8) Four friends take an IQ test. Their scores are 96, 100, 106, 114. Which of the following statements is true?

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I.    The mean is 103.
II.   The mean is 104.
III.  The median is 100.
IV.   The median is 106.
    A. I only
    B. II only
    C. III only
    D. IV only
    E. II and III

9) Third quartile is also called
    A.    25th Percentile
    B.    2nd decile
    C.    75th percentile
    D.    3rd decile

10) The quantity which computed from a population when entire population is available is called
    A.    Parameter
    B.    Statistic
    C.    Variable
    D.    Constant

11) Which of the following statements are true?
    I.    The mean of a population is denoted by x.
    II.   Sample size is never bigger than population size.
    III.  The population mean is a statistic.
        A. I only.
        B. II only.
        C. III only.
        D. All of the above.
        E. II and III

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12) A coin is tossed three times. What is the probability that it lands on heads *exactly* one time?

    A. 0.125
    B. 0.250
    C. 0.375
    D. 0.500

13) Data in the population census report is called

    A.      Primary data
    B.      Secondary data
    C.      Ungrouped data
    D.      Data array.

Question no 14-16 are based on the following description.

Four married couples have bought 08 seats in the same row for a cinema. In how many different ways can they be seated;

14) In how many different ways can they be seated with no restrictions

    A.      8!
    B.      4!*2
    C.      2!*4
    D.      8C2

15) In how many different ways can they be seated if each couple is to sit together

    A.      2!*4*4*4*4
    B.      4!*2*2*2*2
    C.      4!*8
    D.      4!*8!

16) In how many different ways can they be seated if all men sit together to the right of all the women

    A.      4*4
    B.      4!*4
    C.      4!*4!
    D.      4!*8

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17) An bag contains 6 red marbles and 4 black marbles. Two marbles are drawn *with replacement* from the bag.
What is the probability that both of the marbles are black?
   A. 0.16
   B. 0.32
   C. 0.36
   D. 0.40

18) Which of the following is a discrete random variable?
   I. The average weight of a randomly selected group of boys.
   II. The number of students registered at CINEC in 2018
   III. Space available in the Dean's office in square meters
   A. I only
   B. II only
   C. III only
   D. I and II

19) Nuwan earned a score of 940 on a national IQ test. The mean test score was 850 with a standard deviation of 100. What proportion of students had a higher score than Amal? (Assume that test scores are normally distributed.)
   A. 0.10
   B. 0.81
   C. 0.18
   D. 0.82

20) Consider the boxplot below.
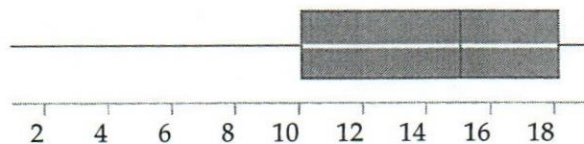


Which of the following statements are true?

I. The distribution is skewed left.
II. The interquartile range is about 8.
III. The median is about 10.

   A. I only

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B. II only
C. I and II
D. II and III

## Question 02 and Question 03 are based on the below description.

Faculty of Management is interested in analyzing the students' satisfaction level of delivery of online lectures via LMS during the COVID-19 lockdown period.

Research team identified core variables for the study listed below

- Quality of LMS
- Quality of the course materials
- Quality of the Support Services in dealing with LMS
- Quality of the Internet Connection
- Students' satisfaction

Research team is decided to collect data using 5-point Likert scale for all the variables listed above.

## Question 02

(a) Write TWO demographic variables useful for the above analysis

(02 Marks)

(b) Write THREE questions to the questionnaire in order to measure the Quality of Course Materials uploaded to the LMS (09 Marks)

(c) Suggest a suitable data collection method for the above study. Note that final report of the study has to be handed over to the Manager Administration, on or before 30th October 2020. (05 Marks)

(d) What are the challenges in the above suggested data collection method.

(04 Marks)

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## Question 03

In each of the following situations regarding the Case Study given above, explain what graphical display you would use to present the information most appropriately. Do a sketch of the display highlighting the important aspects that should be considered in those graphs. (5*4 Marks)

(a) Research team wants to denote the overall students' satisfaction. Assume that overall students' satisfaction is measured using 5-pint Likert scale taking scales as Strongly satisfied, Satisfied, Neutral, Dissatisfied and Strongly Dissatisfied

(b) Research Team wants to present the gender distribution of the sample.

(c) Research team wants to present the Students' satisfaction level by gender.

(d) Research Team is interested in showing the Students' Satisfaction level by the programme type. Programme types offered by the Faculty are Postgraduate, Undergraduate and Foundation.

## Question 04

(a) Consider the following cases and decide whether they are binomial distribution or not (06 Marks)

    (i) Owner of a Imasha Rent-a-Car, who has 16 cars in his company check the availability of break problems in his cars.

    (ii) Faculty coordinator is selecting students those who have passed GCE A/L examination to follow the undergraduate degree programme of the Faculty out of the 100 applications received at the Faculty.

    (iii) Faculty coordinator is categorizing 100 students' application forms based on the school type they attended for their A/L examination, either National School, Semi-Government school or Private School.

(b) LUXroofing Pvt Ltd is a one of the leading manufacturer of Zinc aluminum roofing sheets claims that defective rate of his production is 2%. These roofing sheets are packed using plastic film wrap and there exist 10 sheets in a bundle. Retailer who ordered 25 such wraps, randomly selects a one wrap, which consists of 10 roofing sheets in it.

(i) What is the probability that exactly one of them are defective (03 Marks)

(ii) What is probability that exactly none of them are defective (03 Marks)

(iii) Find the average number of defectives (02 Marks)

(iv) What is the variance (02 Marks)

(v) If a selected wrap consists of more than one defective sheet the lot will be rejected by the retailer. Find the probability that lot will be accepted.(04 Marks)

## Question 05

A new automated production process has had an average of 1.5 breakdowns per day. Because of the cost associated with a breakdown, management is concerned about the possibility of having three or more breakdowns during a day. Assume that breakdowns occur randomly that the probability of a breakdown is the same for any two time intervals of equal length, and that breakdowns in one period are independent of breakdowns in other periods.

(a) Suggest a suitable probability distribution to model the above case (03 Marks)

(b) Write the probability density function of the above suggested distribution

(02 Marks)

(c) What are the parameters of the above distribution (02 Marks)

(d) What is the probability of having three or more breakdowns during a day?

(04 Marks)

(e) What is probability of having no breakdowns during a day? (04 Marks)

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(f) What is the probability of having at most 15 breakdowns in a week (Assume that firm operates FIVE days a week.)                                    (05 Marks)

## Question 06

(a) During COVID-19 lockdown period, most of the higher education institutes conducted online lectures using different modes. Due to the delivery of online lectures, some of the students had problems in connecting to the LIVE lectures, downloading materials and so on. Higher education institutes conducted more midterm assessments, assignments, case studies and quizzes during the delivery online sessions. Professor of Social Sciences course decided to change the evaluation criteria of his course module. Previous evaluation Criteria and new evaluation criteria is given below.

**Previous Evaluation Criteria**

- Assignment Marks - 10% weight
- Midterm assessment – 10% weight
- Quiz/Case study– 10% weight
- Final Examination – 70% weight

**New Evaluation Criteria**

- Assignment Marks - 20% weight
- Midterm assessment – 20% weight
- Quiz/ Case study– 10% weight
- Final Examination – 50% weight

Marks obtained by TEN students of the class for Assignments, Mid term assessment, Case study, quiz and final examination (All marks are in 100%) are summarised below.

- Calculate the final mark obtain by the each students according to the previous evaluation criteria

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- Calculate the final mark obtain by the each students according to the new evaluation criteria.
- Compare the results calculated above

(20 Marks)

Table 6.01

| Student # | Assignment Marks | Mid-term assessment Marks | Quiz/ Case Study | Final Examination Marks |
|---|---|---|---|---|
| 1 | 55 | 65 | 85 | 68 |
| 2 | 62 | 61 | 82 | 78 |
| 3 | 85 | 89 | 79 | 77 |
| 4 | 75 | 70 | 90 | 98 |
| 5 | 45 | 60 | 94 | 81 |
| 6 | 89 | 85 | 88 | 79 |
| 7 | 82 | 80 | 87 | 80 |
| 8 | 75 | 75 | 74 | 79 |
| 9 | 77 | 65 | 96 | 71 |
| 10 | 74 | 59 | 68 | 69 |

## Question 07

In an industrial process, the diameter of a ball bearing is an important component part. The buyers set specifications on the diameter according to their preferences. The implication is that no part falling outside these specifications will be accepted.

It is known that in the process the diameter of a ball bearing has a normal distribution with mean 5.0 and standard deviation 0.005.

Please see the specification of two buyers given below

*Buyer I:*

Specification on the diameter of a ball bearing to be $5.0 \pm 0.01$

*Buyer II:*

Specification on the diameter of a ball bearing to be $5.0 \pm 0.02$

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If ball bearing manufacturer send 1000 ball bears for two buyers calculate the number of ball bears rejected by each buyer.

(20 Marks)

## Question 08

(a) If A, B and C are any three events find expressions and Venn representations for the below events. (2*3 Marks)
  (i) None occurs
  (ii) Only one event occurs
  (iii) Not more than two occurs
(b) Give examples for Geographical, chronological, qualitative and quantitative categorizations (04 Marks)
(c) It has been said that the less the variability, the more an average is representative of a set of data. Comment on the meaning of this statement. (05 Marks)
(d) Describe the relationship between the mean and median of a set of data to indicate the skewness of the distribution of values. (05 Marks)

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

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## The Standardised Normal Distribution Table



The distribution tabulated is that of the normal distribution with mean **zero** and standard deviation 1. For each value of $Z$, the standardized normal deviate, (the proportion $P$, of the distribution less than $Z$) is given. For a normal distribution with mean $\mu$ and variance $\sigma^2$ the proportion of the distribution less than some particular value $X$ is obtained by calculating $Z = (X - \mu)/\sigma$ and reading the proportion corresponding to this value of $Z$.

| Z | P | Z | P | Z | P |
|---|---|---|---|---|---|
| -4.00 | 0.00003 | -1.00 | 0.1587 | 1.05 | 0.8531 |
| -3.50 | 0.00023 | -0.95 | 0.1711 | 1.10 | 0.8643 |
| -3.00 | 0.0014 | -0.90 | 0.1841 | 1.15 | 0.8749 |
| -2.95 | 0.0016 | -0.85 | 0.1977 | 1.20 | 0.8849 |
| -2.90 | 0.0019 | -0.80 | 0.2119 | 1.25 | 0.8944 |
| -2.85 | 0.0022 | -0.75 | 0.2266 | 1.30 | 0.9032 |
| -2.80 | 0.0026 | -0.70 | 0.2420 | 1.35 | 0.9115 |
| -2.75 | 0.0030 | -0.65 | 0.2578 | 1.40 | 0.9192 |
| -2.70 | 0.0035 | -0.60 | 0.2743 | 1.45 | 0.9265 |
| -2.65 | 0.0040 | -0.55 | 0.2912 | 1.50 | 0.9332 |
| -2.60 | 0.0047 | -0.50 | 0.3085 | 1.55 | 0.9394 |
| -2.55 | 0.0054 | -0.45 | 0.3264 | 1.60 | 0.9452 |
| -2.50 | 0.0062 | -0.40 | 0.3446 | 1.65 | 0.9505 |
| -2.45 | 0.0071 | -0.35 | 0.3632 | 1.70 | 0.9554 |
| -2.40 | 0.0082 | -0.30 | 0.3821 | 1.75 | 0.9599 |
| -2.35 | 0.0094 | -0.25 | 0.4013 | 1.80 | 0.9641 |
| -2.30 | 0.0107 | -0.20 | 0.4207 | 1.85 | 0.9678 |
| -2.25 | 0.0122 | -0.15 | 0.4404 | 1.90 | 0.9713 |
| -2.20 | 0.0139 | -0.10 | 0.4602 | 1.95 | 0.9744 |
| -2.15 | 0.0158 | -0.05 | 0.4801 | 2.00 | 0.9772 |
| -2.10 | 0.0179 | 0.00 | 0.5000 | 2.05 | 0.9798 |
| -2.05 | 0.0202 | 0.05 | 0.5199 | 2.10 | 0.9821 |
| -2.00 | 0.0228 | 0.10 | 0.5398 | 2.15 | 0.9842 |
| -1.95 | 0.0256 | 0.15 | 0.5596 | 2.20 | 0.9861 |
| -1.90 | 0.0287 | 0.20 | 0.5793 | 2.25 | 0.9878 |
| -1.85 | 0.0322 | 0.25 | 0.5987 | 2.30 | 0.9893 |
| -1.80 | 0.0359 | 0.30 | 0.6179 | 2.35 | 0.9906 |
| -1.75 | 0.0401 | 0.35 | 0.6368 | 2.40 | 0.9918 |
| -1.70 | 0.0446 | 0.40 | 0.6554 | 2.45 | 0.9929 |
| -1.65 | 0.0495 | 0.45 | 0.6736 | 2.50 | 0.9938 |
| -1.60 | 0.0548 | 0.50 | 0.6915 | 2.55 | 0.9946 |
| -1.55 | 0.0606 | 0.55 | 0.7088 | 2.60 | 0.9953 |
| -1.50 | 0.0668 | 0.60 | 0.7257 | 2.65 | 0.9960 |
| -1.45 | 0.0735 | 0.65 | 0.7422 | 2.70 | 0.9965 |
| -1.40 | 0.0808 | 0.70 | 0.7580 | 2.75 | 0.9970 |
| -1.35 | 0.0885 | 0.75 | 0.7734 | 2.80 | 0.9974 |
| -1.30 | 0.0968 | 0.80 | 0.7881 | 2.85 | 0.9978 |
| -1.25 | 0.1056 | 0.85 | 0.8023 | 2.90 | 0.9981 |
| -1.20 | 0.1151 | 0.90 | 0.8159 | 2.95 | 0.9984 |
| -1.15 | 0.1251 | 0.95 | 0.8289 | 3.00 | 0.9986 |
| -1.10 | 0.1357 | 1.00 | 0.8413 | 3.50 | 0.99977 |
| -1.05 | 0.1469 | | | 4.00 | 0.99997 |

*library*

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## Year 1 Semester II

## SEMESTER END EXAMINATION

## Basic Knowledge in Engineering – ENGK0381

- This paper consists of EIGHT questions on THREE (03) pages.
- Answer FIVE 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: 2020.09.25      Pass mark: 50%      Time: 03 Hours

## Question 01 (Compulsory)

a) What are the uses of following things onboard ships?

(i) Fresh Water      (4 Marks)

(ii) Steam      (4 Marks)

(iii) Compressed Air      (4 Marks)

b) State the purpose of a boiler.      (4 Marks)

c) What is the purpose of oily water separator?      (4 Marks)

## Question 02

a) What is the purpose of MARPOL 73/78 ANNEXES?      (3 Marks)

b) What are the MARPOL 73/78 ANNEXES?      (10 Marks)

c) What is the maximum oil content of bilge water to be discharged over board from machinery spaces ?      (3 Marks)

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d) What is the purpose of Sewage treatment plant? (4 Marks)

## Question 03

a) What are the main components of refrigeration system? (8 Marks)

b) What is the function of expansion valve? (4 Marks)

c) Name 3 IMO recommended primary refrigerants. (4 Marks)

d) In air conditioning systems, what are the temperatures and relative humilities for human comfort? (4 Marks)

## Question 04

a) What are the 2 basic types of boilers? (3 Marks)

b) What is the purpose of boiler safety valve? (4 Marks)

c) Name 5 boiler mountings. (5 Marks)

d) What is the purpose of boiler water level gauge glass? (4 Marks)

e) What is a composite boiler? (4 Marks)

## Question 05

a) What is a pump? (4 Marks)

b) What are the 2 basic categories of pumps used onboard ships? (4 Marks)

c) Write 5 types of pumps used onboard ships and their (applications) uses.

(12 Marks)

## Question 06

a) What is Internal Combustion (I.C.) engine? (4 Marks)

b) What are the 4 events (strokes) taking place in I.C. Engine? (4 Marks)

c) What are the requirements to have combustion? (4 Marks)

d) What are the important elements for combustion in marine fuel oils?  (4 Marks)

e) What are the products of combustion in I.C. Engines?                  (4 Marks)

## Question 07

a) What are the major components of Steering gear system?              (10 Marks)

b) What are the Steering gear tests to be carried out 12 hours before leaving a port?

(10 Marks)

## Question 08

Briefly describe the main purpose of following equipments onboard ships.

a) Fresh water generator                                                (4 Marks)

b) Heavy fuel oil purifier                                              (4 Marks)

c) Windlass                                                             (4 Marks)

d) Hatch covers                                                         (4 Marks)

e) Mooring winch                                                        (4 Marks)

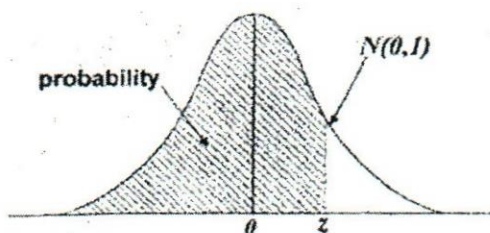-----------------END OF THE QUESTION PAPER------------------

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## Year 1 Semester II

## SEMESTER END EXAMINATION

## Macroeconomics – ECON0317

- This paper consists of EIGHT questions on SIX (06) pages.
- Answer FIVE 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: 2020.09.23          Pass mark: 50%          Time: 03 Hours

## Question 01 (Compulsory)

(a) Following information are related to national income accounts for a hypothetical economy:

Table 1.01

| Information | US $ Billion |
|---|---|
| Agriculture | 2.01 |
| Forestry | 2.91 |
| Fishing | 1.09 |
| Mining and quarrying | 4.37 |
| Manufacturing | 4.52 |
| Electricity, gas and water | 5.32 |
| Sewerage, waste treatment and disposal activities | 4.52 |
| Wholesale and retail trade | 8.45 |
| Information and communication | 7.65 |
| Public administration, defense, education, human health and social work activities | 8.53 |
| Construction | 7.37 |
| Financial, insurance and real estate activities | 5.44 |
| Professional services | 2.38 |
| Indirect taxes | 3.30 |

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| Subsidies | 1.5 |
|-----------|-----|
| Net Factor income from abroad | -2.40 |

Based on the above information, calculate,

(i)    Value added in agriculture sector
(ii)   Value added in industry sector
(iii)  Value added in service sector
(iv)   Gross Domestic Product at factor prices
(v)    Gross Domestic Product at market prices
(vi)   Gross National product at market prices                    (6*3 Marks)

(b) Briefly explain reason behind adding exports income and deducting imports expenditure to calculate GDP in expenditure approach                    (02 Marks)

## Question 02

(a) Briefly explain the main four stages of an economic cycle with characteristics

(04 Marks)

(b) Following information are given for a hypothetical Economy that consists of 3 sectors

Table 2.01

| Components | RS Millions |
|-----------|-------------|
| C | 2000 +0.75yd |
| G | 100 |
| I | 150 |
| T | 0.2Y |
| Tr | 50 |

Based on the above information calculate,

(i)    The value of the equilibrium out put
(ii)   The total private consumption at Equilibrium level of income
(iii)  The Fiscal deficit / surplus of the country
(iv)   The value of new Equilibrium output if investments are increased by Rs. 50 million                    (4*3 Marks)

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(c) explain the reason behind the usage of Real GDP rather than nominal GDP to
gauge economic wellbeing (04 Marks)

## Question 03

(a) Look at the given information regarding employment and unemployment status
in Sri Lanka during the year 2019

Table 3.01

| Total Population | 21,800,000 |
|---|---|
| Working age population | 16,424,000 |
| Economically active population | 8,592,000 |
| Employed population | 8,181,000 |

(i)   Calculate the unemployment rate (03 Marks)
(ii)  Calculate the labour force participation rate (LFPR) (03 Marks)

(b) Sri Lanka is still among the 20 countries that hold the highest gender gaps in
LFPR, worldwide. (Central bank report 2020). Briefly explain the reason behind
impeding the active participation of females in economic activities in Sri Lanka
(04 Marks)

(c) Clearly explain the Individual, Economic and social impact on high
unemployment situation in a country (06 Marks)

(d) What do you mean by natural unemployment? Briefly explain with example
(04 Marks)

## Question 04

Following is an extract from the Central Bank press release on 21st July 2020

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Inflation in July 2020

Headline inflation as measured by the year-on-year (Y-o-Y) change in the Colombo
Consumer Price Index (CCPI, 2013=100) increased to 4.2 per cent in July 2020 from
3.9 per cent in June 2020. This was mainly driven by monthly increase of prices of
items in Non-food category along with the statistical effect of the low base prevailed
in July 2019.

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(i) Clearly explain the main two causes of inflation with appropriate examples and graphs (10 Marks)

(ii) Calculate inflation rate in the year 2020 based on following information
Table 4.01

|  | Value in LKR |
|---|---|
| Cost of the market basket in base year 2013 | 32,500 |
| Cost of the market basket in the year 2019 | 34,300 |
| Cost of the market basket in the year 2020 | 36,000 |

(05 Marks)

(iii) Briefly explain the differences between National Consumer Price Index (NCPI) and Colombo Consumer Price Index (CCPI) (05 Marks)

## Question 05

"The concept, sustainable development has become an area where the world is focusing today with prevailing negative consequences occurring to almost all the countries in the world".

(a) Clearly define the concept "sustainable development" by comparing and contrasting with economic growth and economic development (06 Marks)

(b) "Sustainable Development Goals set by United Nation Development Programme, are mainly targeted to transform our world in 2030". Briefly explain the following 3 goals with appropriate examples
(i) Quality Education
(ii) Gender Equality
(iii) Clean water and sanitation (3*3 Marks)

(c) Explain the main criteria to be used in the calculation of Physical Quality of life index, by further mentioning it's strengths and weaknesses. (05 Marks)

## Question 06

(a) Money is an essential commodity, which acts as a medium of exchange. Clearly explain the reasons behind evolution of money (05 Marks)

(b) Briefly explain the relationship between Inflation and the money supply of a country, with appropriate theories and examples (06 Marks)

(c) Following information are provided for you related to money supply of Sri Lanka, according to central bank report 2019,

Table 6.01

|  | Rs. Billion |
|---|---|
| Currency held by Public | 494.2 |
| Currency held by Commercial Banks | 183.8 |
| Deposits held by Commercial banks in Central Bank | 254.6 |
| Time and Savings Deposits of public in commercial banks | 6,047.2 |
| Adjusted foreign currency deposits | 711.4 |
| Total Demand deposits | 371.3 |

Calculate,

(i) Narrow Money supply (M1), broad Money supply (M2), and the consolidated broad Money supply (M2b) (06 Marks)

(ii) Money Multiplier based on M2 (03 Marks)

## Question 07

(a) Clearly list the main and sub functions of a commercial bank (05 Marks)

(b) Assume a person called Mr. A deposited Rs. 5000 cash in his commercial bank.

Under the assumptions of money creation, calculate

(i) The total amount of deposits created by the commercial banking system

(ii) The total amount of loans created by the commercial banking system

(iii) Prepare the final statement of financial position at the end of money creation process

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if statutory reserve ratio is **20%** (10 Marks)

(c) Clearly explain on the open market operations carried out by central banks as a quantitative tool of controlling money supply. (05 Marks)

## Question 08

(a) Read the below paragraph

The Monetary Board (MB) of the Central Bank of Sri Lanka (CBSL) at its meeting held on 10 July 2020 has decided to suspend business activities of ETI Finance Ltd (ETIF) and Swarnamahal Financial Services PLC (SFSP), in terms of Section 31 of the Finance Business Act, No. 42 of 2011 (FBA) with effect from 13 July 2020. ETIF and SFSP have become insolvent due to various irregularities taken place, since 2011. Hence, due to the inability of Board of Directors and Senior Management of the respective companies to satisfactorily address the said deficiencies, the Monetary Board on 02nd January 2018 issued Directions restricting the affairs of the Companies and the powers of the Board of Directors of the two companies. A Panel of Management was also appointed by the Monetary Board to oversee the affairs of both Companies

(i) As a recent well-known case in Sri Lanka, give your opinions on the duty of Central Bank of Sri Lanka regarding this situation, as the main regulatory authority of Sri Lankan Financial System (08 Marks)

(ii) Briefly explain the importance of financial institutes as "Financial intermediaries" in a country's financial system (05 Marks)

(b) Clearly explain about short term and long-term financial instruments introduced in Sri Lankan Financial Markets. (07 Marks)

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

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### Year 1 Semester II

### SEMESTER END EXAMINATION

### Principles of Management – MAGT0361

- This paper consists of EIGHT questions on THREE (03) pages.
- Answer FIVE 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: 2020.09.21          Pass mark: 50%          Time: 03 Hours

## Question 01: (Compulsory)

Describe Human Resource Management (HRM) process and identify how the knowledge regarding this process can assist the managers in the staffing of the organization and sustaining of high employee performance.          (20 Marks)

## Question 02

(a) Why planning regarded as a primary function of management? Discuss the two (2) key components of planning.          (10 Marks)
(b) Explain the change process that an organization go through highlighting managers role under each step.          (10 Marks)

## Question 03

(a)     Define the term organization structure?          (04 Marks)
(b)     List the six elements of organizational design.          (06 Marks)
(c)     Name one types of structure that is mechanistic and one type of structure that is organic and clearly explain the nature of each structure.          (10 Marks)

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## Question 04

(a) State what is meant by internal and external environment of business. Within the context of the business environment, explain how external factors/ forces and influence the organization performance. (12 Marks)

(b) Briefly explain types of growth strategies used by managers using examples.

(08 Marks)

## Question 05

(a) Define managerial function of control and explain the process of controlling in an organization. (12 Marks)

(b) Explain two main type of control tools used in organisation. (08 Marks)

## Question 06

(a) Briefly explain the roles of a manager. (10 Marks)

(b) Write a short note on "types of problems" and "types of decisions". (10 Marks)

## Question 07

Write short notes on any four (4) of the following topics.

(a) Kurt Lewin's Leadership Styles

(b) Blake Mouton Managerial (Leadership) Grid

(c) Hersey and Blanchard's Situational Leadership Theory

(d) Goal-setting theory

(e) Herzberg's Two-Factor Theory

(f) Maslow's hierarchy of needs

(5*4 Marks)

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## Question 08

(a)    There are various internal and external factors that affect group performance.
       Discuss two internal factors that affect the group performance.    (10 Marks)
(b)    Define and describe the communication process, highlighting its key components.
                                                                          (10 Marks)

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

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### Year 1 Semester II

### SEMESTER END EXAMINATION

### English for Business II – ENGL10308

- This paper consists of FIVE questions on EIGHTEEN (18) pages.
- Answer ALL Questions.
- 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: 2020.09.18          Pass mark: 50%          Time: 03 Hours

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## Question 01                                      (20 marks)

### Read the passage and answer the questions given below.

The shipping container is one of the mainstays of international trade. The globalised modern economy depends on the rapid and efficient movement of goods that containerisation allows. In many ways it was the advent of the container that allowed this globalised economy to develop.

Invented during World War two as an efficient method of moving equipment to the front lines, there are now at any one time up to 15 million containers being used to transport goods on land and sea or waiting to be filled at factories and ports. They are vital in the supply chain and have allowed the added efficiency of "just in time" inventory management, where companies no longer keep large warehouses of stock or parts, but rely on the ability to quickly order what they want from their suppliers. It is estimated that since the 1980s the

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ratio of inventory to GDP in American business' has fallen from 25% to 15%. Altogether total business inventory in the US is estimated at $1.5 trillion, without "just in time" management methods this might be as much as $2.5 trillion.

This means that companies rely more and more on the prompt delivery of parts from their suppliers to fulfill orders. This is particularly true of industries such as computer manufacture, which no longer make all the parts of the products that bear their names, but instead out source, often to suppliers half way around the world. American computer manufacturers are, for example, increasingly dependent on Asian microchip manufacturers in countries such as Taiwan and Thailand. An example of the kind of problems any disruption to the supply chain causes came after the September 11 attacks in the US when the Canadian border was shut for just two days causing chaos in the Detroit car industry, which relies on a regular flow of parts from Canada.

There are three main flows of sea borne cargo: trans-Pacific, trans-Atlantic and Europe-Far East. The trans-Pacific route is by far the largest flow. At 11 million TEU ("twenty-foot equivalent units") a year, it is almost twice the volume of Europe-Far East trade and three times the size of trans-Atlantic traffic. During the 1990s, during America's boom years, the trade of all the routes grew enormously and this led to more and larger ships being built. The container fleet grew by 12% in 2001. Until then, a container ship commonly carried 600 TEU, during the 1990s ships were being build that could carry up to 8000 TEU. However, after the 1990s there was a dramatic fall off in trade. Trans-Pacific trade, for example, fell to 50% of its 1990s high.

This down turn is being handled by the shipping alliances which manage the global trade. These large organizations are responsible for maintaining the fleets and seeing that the flow of goods is uninterrupted. This is a job that governments feel that the regular and reliable flow of trade is so important that in many cases the shipping alliances are exempt from anti-trust and monopoly laws. Their response has been to cut services, rest some of the older ships and share the burden amongst themselves.

At first, containers reduced theft as it was more difficult for casual thieves to get into the containers. However, criminal gangs soon saw the potential for taking whole containers.

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This became a profitable crime as the average value of a container grew to $500,000 by the 1980s. Criminals also benefited from the convenience of containers when using them to transport drugs, illegal immigrants or other illegal goods. Measures to combat this, including stronger locks and preference schemes for shippers who have anti-theft programmes, have had some success, but crime is a constant menace to the container trade.

Increasingly, the huge number of containers and their self-contained and enclosed nature has been raising worries about their possible use by terrorists. In fact, possible terrorists have already been found hiding in containers. This is particularly worrying considering that only 2% of containers are inspected. Containers are also extremely difficult to track and monitor. This is because they pass through so many countries and jurisdictions and because they can travel on both land and sea. Each transaction involving a container can involve as many as 25 different parties and generate between 30 and 40 documents. For a ship carrying 600 TEU this would result in approximately 4000 documents. The sheer scale of the information involved makes tracking containers a daunting task. Screening them to determine the contents is another solution that would take a great deal of effort because of the large numbers of containers. Additionally, it might cause delays in delivery that would disrupt international trade and industry out of proportion to the good the searches do.

For the foreseeable future, there would seem to be no alternative to containers and their use is bound to grow. They are one of the cornerstones of global trade, but many yet cause problems their inventors never envisaged.

**Part A**

Underline the best TWO alternatives to complete the sentences.                    (06 marks)

1.      The invention of containers ...............................................................

     I.      resulted from the efficient movement of goods.
     II.     led to more global trade.
     III.    was initially for military purposes.
     IV.     came just in time for many managers.
     V.      relied on the ability to receive orders quickly.

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2. Containers are important because they ...............................................................

    I.     prevent the need for companies to hold large amounts of stock.

    II.    increase the amount of business inventory.

    III.   make trade between countries on different sides of the world easier.

    IV.   regularly supply manufactures in Canada.

    V.    reduce the amount of out sourcing needed by companies.

3. The Trans-Pacific trade route ...............................................................

    I.     has nearly double the amount of trade as that of the Europe-Far East trade route.

    II.    had its container fleet increase by 12%.

    III.   sparked the boom years of the 1990s.

    IV.   usually carried around 600 TEU.

    V.    has witnessed a substantial decrease in container trade.

**Part B**

Write complete answers for the questions given below. Marks will be reduced if the answers are given in incomplete sentences. (12 marks)

1. Do companies keep large warehouses in the modern context? Give reasons for your answer.

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2. Write two main flows of sea borne cargo?

    a. ...................................................................................

    b. ...................................................................................

3. Why were enormous ships were built in 1990s?

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4. What are the steps taken by the shipping alliances to handle the issues created after the downturn?

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5. "... crime is a constant menace to the container trade". Do you agree with this statement according to the points discussed in the passage? Explain in not more than 30 words.

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6. According to the passage, what are the solutions given to overcome theft in the container trade?

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7. Give a suitable title for the passage above.                    (02 marks)

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## Question 02 (20 marks)

## Part A

Examine the graph and fill in the blanks in the description given below using the words in the box. (10 marks)



**London Underground station passengers**
(Number of people vs Time)
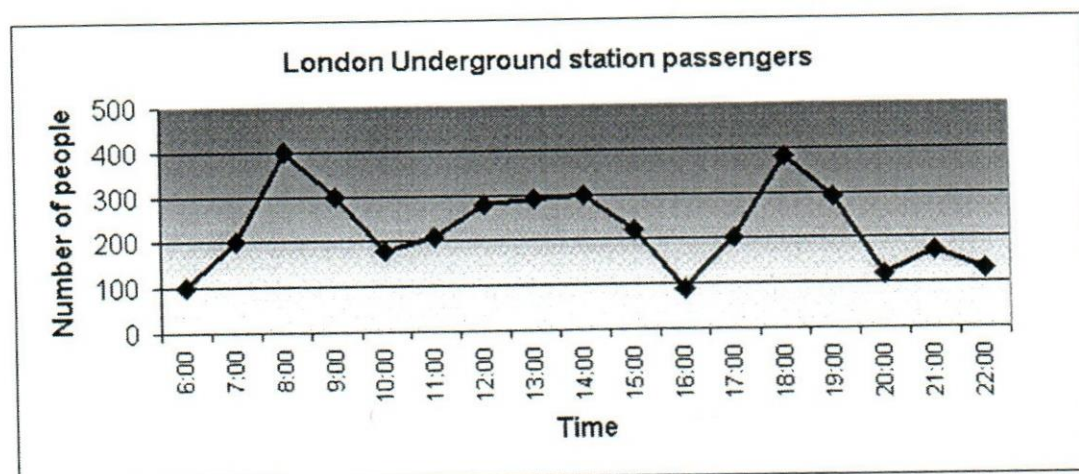
| rises | drop quickly | fluctuations | a slight | a rapid rise |
|---|---|---|---|---|
| decline | fall significantly | sharp increase | a plateau | a peak |

The graph shows the (1) ……………………….. in the number of people at a London underground station over the course of a day.

The busiest time of the day is in the morning. There is a (2) ……………………….. between 06:00 and 08:00, with 400 people using the station at 8 o'clock. After this the numbers (3) ……………….. to less than 200 at 10 o'clock. Between 11 am and 3 pm the number (4)……………………….. , with (5)……………………….. of just under 300 people using the station.

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In the afternoon, numbers (6)............................. with less than 100 using the station at

4 pm. There is then (7)............................. to (8)............................. of 380 at 6pm.

After 7 pm, numbers (9) ............................., with only (10) .............................

increase again at 8pm, tailing off after 9 pm.

Overall, the graph shows that the station is most crowded in the early morning and early

evening periods.

**Part B**
The following graph illustrates the sales turnover of Global Logistics Lanka (Pvt. Ltd).
Examine the graph carefully and write a description in 150 words.          (10 marks)

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## Question 03                                    (20 marks)

### Part A

Fill in the blanks to form a complex sentence using the subordinators given below.

(10 marks)

**because /unless /although / whereas / if**

1. Sri Lanka has a high level of outward migration, _____ Japan's is quite low.

2. _____ the government has tried to reduce people's sugar intake, it has not been successful.

3. People are continuing to get sick in cities _____ there is so much pollution produced by cars.

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4. Transport related problem in Sri Lanka will not be solved _____ the government take immediate action.

5. More people will attend university _____ the government provides student funding.

## Part B

Underline the most suitable subordinator.                                    (10 marks)

1. The employees must be in at eight o clock ..................... (unless/ because/ although) it is the company rule.
2. She got her first degree ..................... (when/ which/ who) she was 20 years old.
3. You will be able to apply for a job ..................... (although/ unless/ provided) you complete your first degree.
4. I met my friend in London, ..................... (where/ wherever/ whereas) she grew up from a young age.
5. The responsibility is with ..................... (however/ whoever/ whenever) is taking care of the children.
6. You can go to the party ..................... (unless/ wherever/ as long as) you have completed you work.
7. The computer stopped working ..................... (while/ when/ where) the power cut out.
8. ..................... (Whenever/ If/ After) you arrive is fine with us.
9. My boss, ..................... (who/ where/ when) lives in Japan, likes Japanese culture.
10. I watched the TV documentary on logistics management ..................... (unless/ before/ because) I went to bed.

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## Question 04                                         (20 marks)

**Imagine you are a suitable candidate for the following post and write a cover letter to the Human Resources Manager.**

### Manager – Transport & Logistics

We are looking for an efficient individual to be responsible for managing logistics activities of the company located in Kadawatha and you are required to organize and monitor distribution of goods to customers, depot and showrooms while maintaining a good rapport with the stakeholders.

### Required Qualification

- 4-year college degree
- Minimum of 2-year work experience
- Strong cognitive skills, including problem analysis and decision making
- Ability to work flexible hours including weekends

### Description

- Complete accountability on warehouse management
- Extensively handle the incoming and outgoing cargo/raw materials
- Record keeping and inventory handling
- Work closely with systems implementation and their management.

### Required Skills

- Coordinating skills
- Strong organizational skills
- Interpersonal skills
- Good communication skills
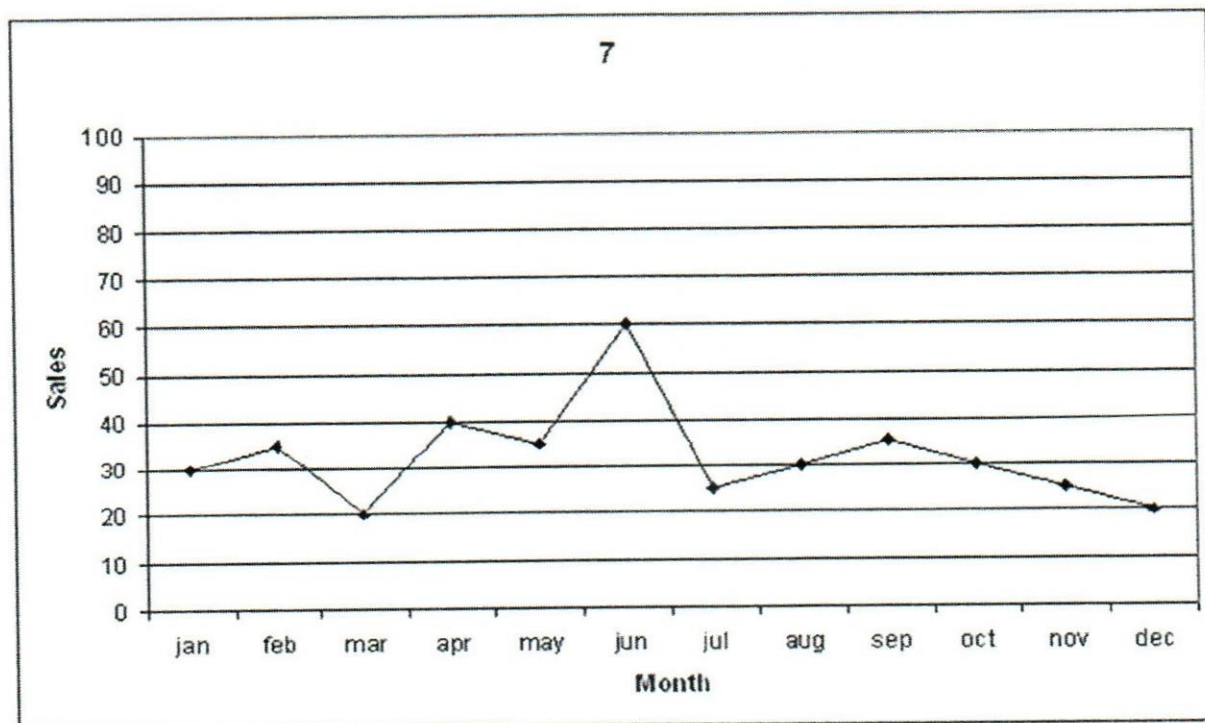
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*Manager- Human Resources and Administration,*

*PO Box 04893*

*Kadawatha*

(Word count: 150)

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## Question 05 (20 marks)

Write an essay on the following topic. (Word count – 200 words)

a) Illustrate the main points in a diagram.

b) Write your essay accordingly.

**Some people think that in order to deal with the problem of congestion in cities, privately owned vehicles should be banned in main cities, while others consider this to be unrealistic solution.**

Discuss both sides and give your opinion clearly.

**Part A** (05 marks)

Illustrate the main points in a diagram.

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**Part B** (15 marks)

Write your essay based on the above structure. (Word count – 200 words)

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

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## Year 1 Semester II

### SEMESTER END EXAMINATION

### Mathematics for Business II – MATH0379

- This paper consists of EIGHT questions on SIX (06) pages.
- Answer FIVE 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: 2020.09.16          Pass mark: 50%          Time: 03 Hours

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## Question 01 -(Compulsory)

(a) Find the general solution of the following Second Order Differential Equations.

$$2\,\frac{d^2y}{dt^2} + \frac{dy}{dt} - y = 0$$          (04 Marks)

(b) Consider the following function F. Find $\dfrac{\partial^3 F}{\partial x \partial y \partial z}$

$$F\,(x,y,z) = e^{2xy+3xz}$$

(04 Marks)

(c) Check the following Graph is Eulerian graph or Not? Justify your answer.

(10 Marks)

(d)    The velocity 'v' of a particle is given by $v = e^{2t} Cos [(\frac{\pi}{2}) t]$. Find the distance

(s) travelled by the particle from t =2 to t = 3 given that $v = \frac{ds}{dt}$

(06 Marks)

(e)    Suppose a simple graph has 15 edges, 3 vertices of degree 4, and all

Others of degree 3.  How many  vertices does the graph has?

(04 Marks)

(f)    State whether following proposition is true or false. Justify your answer.

$$\exists \ x \in \ (5, \infty) \cap N, \ x^2 \leq 25$$

(06 Marks)

Page 2 of 6

(g)     Draw the graph for the following

$$F(x) \begin{cases} -3, & x \in Z^+ \\ \\ 2, & x \in Z^- \end{cases}$$

Finding the area which covered by F with x- axis from x = - 2 to x = 3

(06 Marks)

## Question 02

A building supply has two locations in town. The office receives orders from two customers, each requiring 3/4-inch plywood. Customer A needs fifty sheets and Customer B needs seventy sheets. The warehouse on the east side of town has eighty sheets in stock; the west-side warehouse has forty-five sheets in stock. Delivery costs per sheet are as follows: $0.50 from the eastern warehouse to Customer A, $0.60 from the eastern warehouse to Customer B, $0.40 from the western warehouse to Customer A, and $0.55 from the western warehouse to Customer B.

Use Linear Programming Method to Find the shipping arrangement to minimize the Total transportation cost.                                    (15 Marks)

## Question 03

(a) Draw the graph whose vertices and edges are as follows. Is this graph simple graph? Justify your answer.

V = { u, v, w, x, y, p, q, r, s, t, o }     E = {us, vp, xr, ox, ux, vx, vy, wy, ox}

(04 Marks)

(b) Suppose that a tree has two vertices of degree 5. Three vertices of degree 4, six vertices of degree 3, eight vertices of degree 2 and r vertices of degree 1. Find r

(05 Marks)

(c) Is there a exist graph on 18 vertices where two vertices have degree 16 and the other 16 Vertices have degree 2. Justify your answer.　　　　(06 Marks)

## Question 04

(a) Find the general solution of the following Second Order Differential Equations. (y is function of t)

(i)　$9\frac{d^2y}{dt^2} - 6\frac{dy}{dt} + y = 0$　　　　(ii)　$\frac{d^2y}{dt^2} + \frac{dy}{dt} + y = 0$　　(06 Marks)

(b) Find the particular solution of the following Second Order Differential Equations.

(y is function of t)

(i)　$2\frac{d^2y}{dt^2} + \frac{dy}{dt} - y = 0$ ,　　$y(0) = -1$ ,　$y'(0) = 1$

(ii)　$9\frac{d^2y}{dt^2} + 6\frac{dy}{dt} + y = 0$ ,　$y(0) = 1$ ,　$y'(0) = -2$　　(09 Marks)

## Question 05

(a) Use the logarithm laws to simplify the following

(i)　$\log_4 (2xy)^3 - \log_4 (2xy^2) + \log_4 (3x^2 y^3)$
(ii)　$\log_3 (81x^4) - \log_3 (3x)^2$

: Marks)

(b) If $\log_{10} (8) = x$ and $\log_{10} (3) = y$ , express the following in terms of x , y only

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(i)  $\log_{10} ( 48/81 )$
(ii)  $\log_{10} ( 480 )$

(04 Marks)

(c) The cube root of x varies inversely as the square of y ;

if x = 8  when  y = 3 , find x when y = 5/2          (04 Marks)

(d) Simplify  the followings

$$[( a^2 b^{-1} c^3 )^2 * ( 2bc )^{-2}] \ / \ [(abc)^3]$$

(03 Marks)

## Question 06

(a)  Consider the following function F .

$F ( x,y,z ) = x^2 y^3 z + x y^2 + y^3 + x^4 z^3$

Find the following partial derivatives with respect to x, y and z.

(i) $\frac{\partial F}{\partial x}$     (ii) $\frac{\partial F}{\partial y}$     (iii) $\frac{\partial^2 F}{\partial x \partial y}$     (iv) $\frac{\partial^2 F}{\partial x \partial z}$   (v) $\frac{\partial^3 F}{\partial y \partial x \partial z}$

(15 Marks)

## Question 07

(a) Determine the following indefinite integral. (a , b  and c are constants)

(i)   $\int cb \, \text{Cos} \, ax \, dx$

(ii)   $\int b \, e^{ax} \, dx$

(06 Marks)

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(b) Determine the following definite integral. ( a is constant )

(i)   $\int_{-1}^{1} |x^2 - 1| \ dx$

(ii)  $\int_{0}^{\pi/2a} 4 \operatorname{Sin} ax \ e^{-\operatorname{Cos} ax} \ dx$

(06 Marks)

(c) Calculate the area enclosed by  $y = -t^2 + 6$  and  y = 3

(03 Marks)

## Question 08

Transport company has two types of trucks, Type A and Type B. Type A has a refrigerated capacity of 20 m3 and a non-refrigerated capacity of 40 m3 while Type B has the same overall volume with equal sections for refrigerated and non-refrigerated stock. A grocer needs to hire trucks for the transport of 3,000 m3 of refrigerated stock and 4 000 m3 of non-refrigerated stock. The cost per kilometer of a Type A is $30, and $40 for Type B. Build Linear Programming model to determine how many trucks of each type should the grocer rent to achieve the minimum total cost?

(15 Marks)

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

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Year 1 Semester II

SEMESTER END EXAMINATION

Mathematics for Business II – MATH0379

- This paper consists of EIGHT questions on SIX (06) pages.
- Answer FIVE Questions including Question 01.
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- Write legibly

Date: 2020.09.16          Pass mark: 50%          Time: 03 Hours

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## Question 01 -(Compulsory)

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(04 Marks)

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(04 Marks)

(c) Check the following Graph is Eulerian graph or Not? Justify your answer.

(10 Marks)

(d) The velocity 'v' of a particle is given by $v = e^{2t} \, Cos \, [\left(\frac{\pi}{2}\right) t]$. Find the distance

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(06 Marks)

(e) Suppose a simple graph has 15 edges, 3 vertices of degree 4, and all

Others of degree 3. How many vertices does the graph has?

(04 Marks)

(f) State whether following proposition is true or false. Justify your answer.

$$\exists \, x \in (5, \infty) \cap N, \, x^2 \leq 25$$

(06 Marks)

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Finding the area which covered by F with x- axis from $x = -2$ to $x = 3$

(06 Marks)

## Question 02

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(04 Marks)

(b) Suppose that a tree has two vertices of degree 5. Three vertices of degree 4, six vertices of degree 3, eight vertices of degree 2 and r vertices of degree 1. Find r

(05 Marks)

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(y is function of t)

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(y is function of t)

(i) $2\frac{d^2y}{dt^2} + \frac{dy}{dt} - y = 0$ , $y(0) = -1$, $y'(0) = 1$

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Marks)

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(ii)  $\log_{10} ( 480 )$

(04 Marks)

(c) The cube root of x varies inversely as the square of y ;

if x = 8  when  y = 3 , find x when y = 5/2          (04 Marks)

(d) Simplify  the followings

$$[( a^2 b^{-1} c^3 )^2 * ( 2bc )^{-2}] \ / \ [(abc)^3]$$

(03 Marks)

## Question 06

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(15 Marks)

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(06 Marks)

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(03 Marks)

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(15 Marks)

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