

UNIVERSITI TUNKU ABDUL RAHMAN

ACADEMIC YEAR 2019/2020

JANUARY 2020 TRIMESTER

FINAL ASSESSMENT

**UDPS2293/UGPS2293 QUEUEING MODELS**

DATE & TIME OF DOWNLOAD: **9:00 AM, 4<sup>TH</sup> MAY 2020**

DATE & TIME OF SUBMISSION: **9:00 AM, 8<sup>TH</sup> MAY 2020**

DURATION: 4 DAYS

BACHELOR OF ENGINEERING (HONS) INDUSTRIAL ENGINEERING  
BACHELOR OF SCIENCE (HONS) STATISTICAL COMPUTING AND  
OPERATIONS RESEARCH

**Instructions to Students:**

**General**

1. This Final Assessment (FA) is an Individual, Open-Book assessment which consists of TWO (2) questions. Each question carries 25 marks.
2. You are required to answer **ALL** questions, and submit the **ANSWER SCRIPT** by **9:00am, 8<sup>th</sup> MAY 2020**.
3. During the period of **4 days** of this FA, the examiner can be reached at  
Email: loois@utar.edu.my  
You may use the above e-platform to check with the examiner if you need any clarification on this FA question paper.
4. You may refer to any books, lecture notes, published materials, online resources etc. when answering the questions. Proper referencing is necessary to avoid plagiarism. However, **Copy-and-Paste, Consultation, Discussion and Sharing of Answers** are **STRICTLY PROHIBITED** in this FA.

## **UDPS2293/UGPS2293 QUEUING MODELS**

### **Answer Script Preparation**

5. The answer script **MUST** be a **PDF file/Microsoft Word file**, in A4 size format. **Note: The file size is limited to 10MB.**
6. You **MUST** name your softcopy answer script file using the following file name for submission:  
**[Course Code]\_FA\_[Programme Abbreviation]\_[Your Index Number]**  
*Note: Please check you index number generated by the Division of Examinations, Awards, and Scholarships (DEAS).*  
 For example, if you are from the degree programme SC, and your Index Number is A12345DBBTF, then your answer script should be named as

**UDPSXXXX\_FA\_SC\_A12345DBBTF.pdf**

### **Answer Script Submission**

7. Your answer script file has to be submitted to **WBLE** or **looisy@utar.edu.my** before the due time/date.
8. Answer script submitted after the due time/date may incur a late penalty as the following:

Extended/Reflective Assignment : (*guideline : 20% mark deduction per day*)

- (a) ONE day late : 20 % mark deduction
- (b) TWO days late : 40% mark deduction
- (c) THREE days late : 60% mark deduction
- (d) More than 3 days: 100% mark deduction

### **Contents of Answer Script**

9. You **MUST** use the template given (**Appendix 1**) and fill up the following information in the first page of your answer script.
  - You Degree Programme (Abbreviation)
  - Your Index Number
  - Your Name
  - Your Student ID
10. You **MUST** sign on the Declaration Form (second page of your answer script) to indicate your authenticity of submitted work without plagiarism.
11. Each question should be answered starting on a new page. In your answer script, all texts **MUST** be typed using **Times New Roman** characters with font size **12**, except for the drawings/equations/calculations.
12. For drawings, you **MUST** draw/write them on a blank paper, and then take pictures and **include the pictures in the Word document** as part of your answers before you **convert it to PDF file**. It is recommended that the size of each picture file should be kept in a range of 10kB ~ 500kB.
13. Please include a page number on each and every page of your answer script.

**UDPS2293/UGPS2293 QUEUING MODELS****Rules and Regulations**

14. Answer scripts will be uploaded by the examiners to Turnitin for similarity check. In the case of plagiarism being suspected, the evidences will be submitted to the University Examination Disciplinary Committee for further investigation and possible hearing. If you are found guilty, a suspension of TWO trimesters will be imposed on you.
15. You are also **NOT ALLOWED** to have discussion and sharing of information with the others as this is not a group but individual assessment.

**UDPS2293/UGPS2293 QUEUING MODELS****Question1. Article Review**

You are required to find a conference or journal article with an application of queuing system. Write an article review that address the following items.

Outline of article review

A. Introduction

- Brief introduction of the project
- Problem statement / research objective

B. Methodology

- Data collection framework
- Proposed Model / simulation
- Relevant information

C. Result and Discussion

- Measure of performance
- Result interpretation
- Relevant discussion

D. Personal review

- Your overall evaluation of this article
- Your suggestion on alternative method, data collection framework, measure of performance etc
- Other critical reviews

The purpose of this assessment is to allow students to apply the terminology and principal of queuing models that students have learned in this course to the understanding and evaluation of a research article. Students may follow but not limited to the items stated in the outline.

Please write the review according to the section stated in the outline. The review is to be Microsoft Word-processed, Times New Roman font, size 12, not more than two pages in length.

Individual Presentation using a Video Clip: Students are required to present orally a summary of this article review. Students may use any computer-aided presentation methods such as PPT, voice-over, audio recording or video originally taken by webcam, camera, mobile phone or other devices. The length of the video should 2 and 3 minutes.

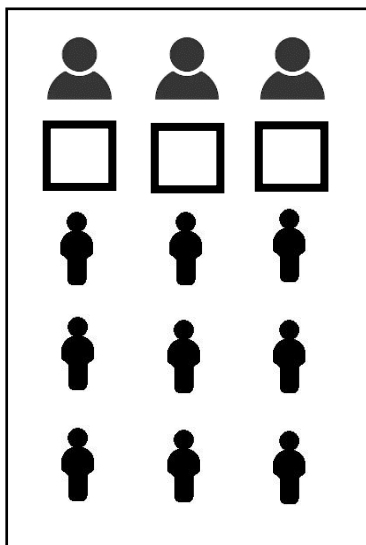
[Total marks: 25 marks]

## UDPS2293/UGPS2293 QUEUING MODELS

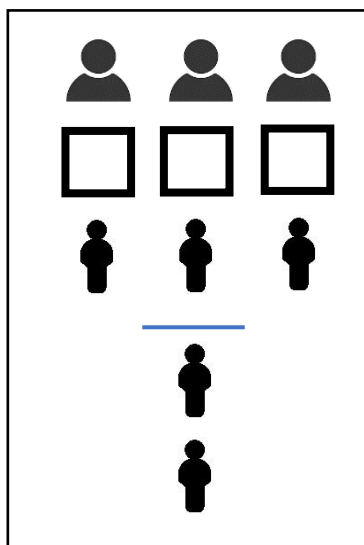
### Question 2. Comparison on Queuing Systems

Consider you are an owner of a business. You plan to open a shop and hire three staffs to take care of the counters. Since you had took the course of Queuing Models, you are considering some options for the counter setup in your shop.

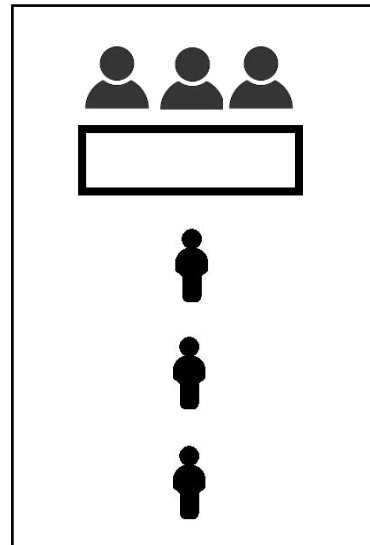
System I:	3 servers with 3 queues	(Multiple M M 1)
System II:	3 servers with 1 queue	(M M s)
System III:	1 server with 1 queue	(M M 1)



System I



System II



System III

Consider the customers arrival rate is  $\lambda$  per hour. The average service time in system I & II is 3 minutes per customers, whereby the average service time in system III is 1 minute per customer. Write a comparison report for the mentioned above systems.

Outline of comparison report:

A. Necessary assumptions:

- The nature of your business (fast food restaurant, hyper market etc)
- Model assumption (e.g. arrival rate for single server in system I is  $\frac{\lambda}{3}$ )

B. Measure of performance:

- Consumer perspective (average waiting time, average waiting length etc)
- Owner perspective (utilization etc)

C. Personal recommendation:

- Recommend a system with justification
- Other relevant opinion or suggestion

**UDPS2293/UGPS2293 QUEUING MODELS**

Please write the comparison report according to the section stated in the outline. Students may follow but not limited to the items stated in the outline. Students are required to identify sources by citing them in the text of the report and referencing them at the end of the report. The comparison report is to be Microsoft Word-processed, Times New Roman font, size 12, not more than two pages in length.

[Total marks: 25 marks]

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**UDPS2293/UGPS2293 QUEUING MODELS****(Remark: This must be placed as the FIRST PAGE of your Answer Script)**

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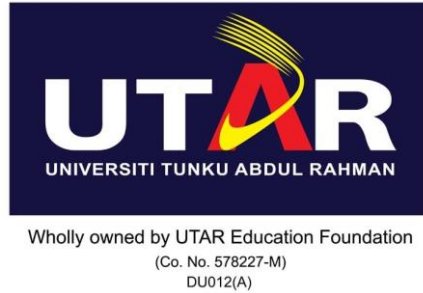
**ANSWER SCRIPT****Candidate is required to fill in ALL the information below:**

Name : (as stated in Student Identity Card)			
Faculty /Institute/ Centre:		Programme :	
Index No. (in numbers) :		Index No. (in words) :	
Course Code :		Course Description :	
Submission Date :		Time :	

QUESTION NUMBER	FOR EXAMINER'S USE ONLY	
	MARKS	
	Internal	External
<b>TOTAL MARKS</b>		

**UDPS2293/UGPS2293 QUEUING MODELS**

**(Remark:** This must be placed as the **SECOND PAGE** of your Answer Script)

**DECLARATION STATEMENT**

I, \_\_\_\_\_ (Name), Student ID No. \_\_\_\_\_, hereby solemnly and fully declare and confirm that during my programme of study at Universiti Tunku Abdul Rahman, I shall abide and comply with all the rules, regulations and lawful instructions of Universiti Tunku Abdul Rahman and endeavour at all times to uphold the good name of the University.

I hereby declare that my submission for this Final Assessment is based on my original work, not plagiarised from any source(s) except for citations and quotations which have been duly acknowledged. I am fully aware that students who are suspected of violating this pledge are liable to be referred to the Examination Disciplinary Committee of the University.

Programme:	
(Digital) Signature:	
Student's I.C / Passport No.:	
Index No:	
Date of Submission:	



**UDPS2293/UGPS2293 QUEUING MODELS****Report Template**

Question 1.

Title of Journal Article: \_\_\_\_\_

Authors: \_\_\_\_\_

Journal: \_\_\_\_\_

**A. Introduction**


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**B. Methodology**


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**C. Result and Discussion**


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**D. Personal Review**


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Index Number (in figure): \_\_\_\_\_ Course Code: \_\_\_\_\_ Page: \_\_\_\_\_

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This assessment paper consists of 2 questions on 10 printed pages.

**UDPS2293/UGPS2293 QUEUING MODELS**

Question 2.

A. Necessary assumptions

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B. Measure of performance

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C. Personal recommendation

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Index Number (in figure): \_\_\_\_\_ Course Code: \_\_\_\_\_ Page: \_\_\_\_

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This assessment paper consists of 2 questions on 10 printed pages.