KOLEJ UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF COMPUTING AND INFORMATION TECHNOLOGY

ACADEMIC YEAR 2020/2021

SEPTEMBER EXAMINATION

COMPUTER SCIENCE BACS2163
SOFTWARE ENGINEERING

SATURDAY, 26 SEPTEMBER 2020   TIME: 9.00 AM – 12.00 NOON (3 HOURS)

BACHELOR OF COMPUTER SCIENCE (HONOURS) IN DATA SCIENCE
BACHELOR OF COMPUTER SCIENCE (HONOURS) IN SOFTWARE ENGINEERING

BACHELOR OF INFORMATION TECHNOLOGY (HONOURS) IN SOFTWARE SYSTEMS
DEVELOPMENT

Instructions to Candidates:

Answer **ALL** questions in the requested format or template provided.

- This is an open book final online assessment. You MUST answer the assessment questions on your own without any assistance from other persons.
- You must submit your answers within the following time frame allowed for this online assessment:
  o The deadline for the submission of your answers is **half an hour** from the end time of this online assessment.
- Penalty as below **WILL BE IMPOSED** on students who submit their answers late as follows:
  o The final marks of this online assessment will be reduced by 10 marks for answer scripts that are submitted within 30 minutes after the deadline for the submission of answers for this online assessment.
  o The final marks of this online assessment will be downgraded to zero (0) mark for any answer scripts that are submitted after one hour from the end time of this online assessment.
- Extenuation Mitigating Circumstance (EMC) encountered, if any, must be submitted to the Faculty/Branch/Centre within 48 hours after the date of this online assessment. All EMC applications must be supported with valid reasons and evidence. The UC EMC Guidelines apply.

FOCS Additional Instructions to Candidates:
- Include your **FULL NAME**, **STUDENT ID** and **PROGRAMME OF STUDY** in your submission of answer.
- Read all the questions carefully and understand what you are being asked to answer.
- Marks are awarded for your own (original) analysis. Therefore, use the time and information to build well-constructed answers.

This question paper consists of 4 questions on 4 printed pages.

BACS2163 SOFTWARE ENGINEERING

Question 1

Crispy&Crunchy is a local restaurant that serves western cuisine. The restaurant is closed recently for renovation and aiming to reopen in three months. Majority of the restaurant customers are aged 23 to 45 years old. The restaurant owner, Mr. Steve, strongly believed that technology enhanced food ordering system is welcomed by their customers and staffs. Mr. Steve requested a centralized data management which serves concurrent ordering processes.

You, as the project manager of the project are responsible to build the food ordering system for the restaurant. The food ordering system shall support both mobile and iPad platforms. The waiter/waitress shall be able to take the customers' order using their mobile or iPad devices and send the order to the kitchen through the system. There are four main modules to be developed; customers account management, online staff account management, online food ordering and payment, and online food catalogues management. The project is ranked as high priority and you plan to allocate eight senior software engineers in getting the system to be ready within three months.

a)   Identify if the food ordering system as mentioned above is a generic software product or bespoke software product? Justify your answer with **TWO (2)** reasons.   (1 + 4 marks)

b)   Recommend and explain **ONE (1)** software process model to develop food ordering system as mentioned above. Justify your recommendation with **FOUR (4)** reasons.   (2 + 8 marks)

c)   Suggest and explain **THREE (3)** software quality attributes for this food ordering system as mentioned above. Justify your suggestions.   (6 marks)

d)   As a project manager, you would need to consider the factors that could motivate employees throughout the project. Suggest and explain **TWO (2)** motivating factors for this case based on the Maslow Motivation Model.   (4 marks)

[Total: 25 marks]

Question 2

DailyPress is a newspaper company which started its first printed newspaper in 1960s. Recently, you are invited to attend a discussion meeting with DailyPress Company's IT department. The main agenda of the meeting is to decide on the maintenance of some of their legacy systems. One of their legacy systems is a text file storage server which stores large amount of the newspaper draft contents (original story from the interview, news draft, supporting images or news, and et cetera). The file storage system has no documentation and no proper module design. The draft contents might be useful in the future to trace the original story.

a)   Draw a diagram to explain legacy system assessment and management based on the *Business Value* and *System Quality* areas. Identify and justify which strategy you should apply to maintain DailyPress's legacy system.   (3 + 3 marks)

This question paper consists of 4 questions on 4 printed pages.

BACS2163 SOFTWARE ENGINEERING

Question 2 (Continued)

b)   Advice DailyPress regarding **TWO (2)** factors affecting their legacy system maintenance cost using your own words. (4 marks)

c)   Assuming that DailyPress IT department has decided to re-engineer the legacy system. Propose **ONE (1)** system organization/structuring design model. Explain and justify your answer.

(2 + 4 marks)

d)   Prepare a Gantt Chart to re-engineer the DailyPress's legacy system based on the following table. Assume that the project starts in October. (9 marks)

Task ID	Task Description	Predecessor	Duration (month)	Overlap (month)
A	Requirement Engineering	None	½	None
B	System Analysis & Design	A	½	¼
C	Customer Feedback	A	½	¼
D	Coding	B,C	1	¼
E	Customer Feedback	B,C	1	¼
F	Testing	E	¼	None
G	Deployment	F	¼	None

[Total: 25 marks]

Question 3

TAcademy is a well-known private college who provides quality education focusing on computer sciences and engineering. The president of TAcademy is planning to computerize a series of services such as facilities booking, library book return and borrow, photocopying machines, et cetera. Students' identity card will be converted into electronic identity (e-ID) to ease the students to access the series of services provided by TAcademy.

a)   Compose **FIVE (5)** functional requirements and **TWO (2)** non-functional requirements for the TAcademy computerized system. (5 + 4 marks)

b)   Compare and contrast between *Stress Testing* and *Module Testing*. Produce **TWO (2)** examples of test cases for each testing technique based on the TAcademy computerized services system.

(4 + 4 marks)

c)   Propose and explain **TWO (2)** functional classifications of Computer Assisted Software Engineering (CASE) tools with **TWO (2)** specific examples of tools for each classification that can be used by TAcademy College. (8 marks)

[Total: 25 marks]

_____

This question paper consists of 4 questions on 4 printed pages.

BACS2163 SOFTWARE ENGINEERING

Question 4

a) Live100 is an online video streaming system that allows the subscribers to view variety of television channels and movies online. This is a soft real time system since its operation will be degraded if the next frame of video is not produced according to the specified timing requirements. Identify **TWO (2)** sets of stimuli-responses for the Live100 system. (6 marks)

b) WonderLife is a veterinary, pet food and pet care shop. It is a small scaled family business founded in 1990s. Recently the shop owner, Anderson, plans to sell its products online. He has contacted your company, a software house, to handle this project.

   i) Identify **FIVE (5)** viewpoints for the online pet shop project. Construct a viewpoint hierarchy to present your viewpoints. (7 marks)

   ii) Suggest and explain **FOUR (4)** good *User Interface (UI)* design rules that you will adopt here based on the given context. Justify your suggestions. (8 marks)

c) Discuss how *cohesion* and *coupling* in system design would affect the maintainability of a system. (4 marks)

[Total: 25 marks]