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Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

**FINAL EXAMINATION
SEMESTER II
SESSION 2023/2024**

COURSE NAME : SOFTWARE ENGINEERING

COURSE CODE : BEJ 42303

PROGRAMME CODE : BEJ

EXAMINATION DATE : JULY 2024

DURATION : 3 HOURS

INSTRUCTIONS :

1. ANSWER ALL QUESTIONS
2. THIS TEST IS CONDUCTED VIA
 Open book
 Closed book
3. STUDENTS ARE **PROHIBITED** TO CONSULT THEIR OWN MATERIAL OR ANY EXTERNAL RESOURCES DURING THE EXAMINATION CONDUCTED VIA CLOSED BOOK

THIS QUESTION PAPER CONSISTS OF **FOUR (4)** PAGES

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TERBUKA

- Q1** (a) List **FIVE (5)** types of diagrams in Unified Modelling Language. (5 marks)
- (b) Describe the types of models in model-driven engineering. (6 marks)
- (c) **Table Q1.1** shows the tabular description of the weather report use case for a Weather Station System. Transform the tabular description of the weather report use case to the sequence diagram describing data collection.

Table Q1.1

System	Weather station
Use-case	Weather Report
Actors	Weather information system, Weather station
Description	The weather station sends a summary of the weather data that has been collected from the instruments in the collection period to the weather information system. The data sent are the maximum, minimum, and average ground and air temperatures; the maximum, minimum, and average air pressures; the maximum, minimum, and average wind speeds; the total rainfall; and the wind direction as sampled at five-minute intervals.
Stimulus	The weather information system establishes a satellite communication link with the weather station and requests transmission of the data.
Response	The summarized data is sent to the weather information system.
Comments	Weather stations are usually asked to report once per hour but this frequency may differ from one station to another and may be modified in the future.

(8 marks)

- (d) **Figure Q1.2** shows one of the architectural patterns in software engineering. Based on your analysis, identify:

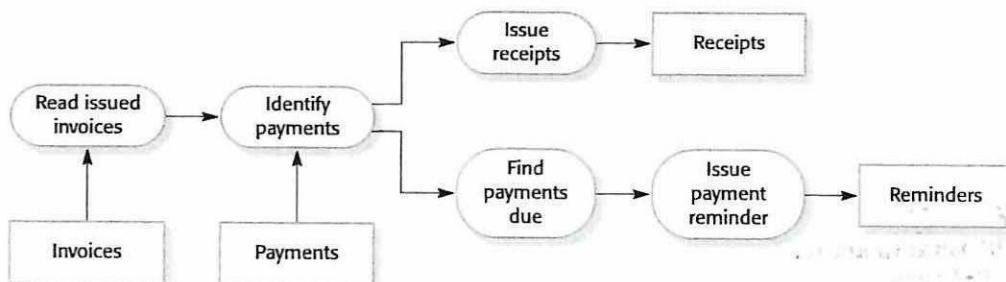


Figure Q1.2

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- (i) The name of this architectural pattern. (1 mark)
- (ii) When it can be used. (2 marks)
- (iii) What are the advantages and disadvantages of this architectural pattern? (3 marks)
- Q2** (a) List the common activities of process stages in the object-oriented design process. (5 marks)
- (b) Describe **FOUR (4)** types of Reuse-Based Software Engineering. (6 marks)
- (c) Explain the Component-Based Software Engineering (CBSE) with reuse. (6 marks)
- (d) As an electronic engineer who specializes in software system engineering, you have been assigned the task of designing a traffic management system. Draw a diagram of the system with a master-slave architecture. (8 marks)
- Q3** (a) There are **TWO (2)** goals in the software testing process. Explain it. (5 marks)
- (b) You are required to supervise a junior testing engineer to do testing of a system. As a senior testing engineer, produce the general testing guidelines of the system. (5 marks)
- (c) Draw a complete diagram of the software testing process model. (6 marks)
- (d) As a software manager, you have been tasked with whether to upgrade, replace, scrap, or continue maintaining a legacy system in your company. However, legacy system replacement is risky and expensive. Evaluate this task and draw the diagram of the legacy system categories assessment. (9 marks)
- Q4** (a) Describe the **FOUR (4)** sub-models in COCOMO 2. (4 marks)
- (b) As a project manager, you must manage several risks that could occur during project development. Based on your evaluation, provide the strategy to help manage the following risks.
- (i) Organizational restructuring (1 mark)

- (ii) Underestimated development time (1 mark)
 - (iii) Requirements changes (1 mark)
 - (iv) Staff illness (1 mark)
 - (v) Organizational financial problems (1 mark)
- (c) Draw the diagram of the risk management process in software engineering project management. (8 marks)
- (d) A high-speed train is composed of several millions of individual parts and requires thousands of workers to assemble. A 100-storey building is another example of complexity. The first version of Microsoft Word required 55 person-years, resulted in 249,000 lines of source code, and was delivered four (4) years late. High-speed trains and 100-storey buildings are usually delivered on time and below budget, whereas software is often not. Discuss what are, in your opinion, the differences between developing a high-speed train, a 100-storey building, and a word processor which would cause this situation. (8 marks)

-END OF QUESTIONS -