Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2022/2023

COURSE NAME	:	SOFTWARE ENGINEERING
COURSE CODE	:	BEJ 42303
PROGRAMME CODE	:	BEJ
EXAMINATION DATE	:	FEBRUARY 2023
DURATION	:	3 HOURS
INSTRUCTION	:	1. ANSWER **ALL** QUESTIONS. 2. THIS FINAL EXAMINATION IS CONDUCTED VIA **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 **FIVE (5)** PAGES

Q1 (a) List five (5) types of diagrams in Unified Modelling Language.

(5 marks)

(b) **Table Q1(b)** shows the tabular description of the report weather use-case for a Weather Station System. Transform the tabular description of the report weather use-case to the sequence diagram describing data collection.

(8 marks)

Table Q1(b)

System	Weather station
Use-case	Report weather
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.

(c) Describe six (6) compiler components.

(6 marks)

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

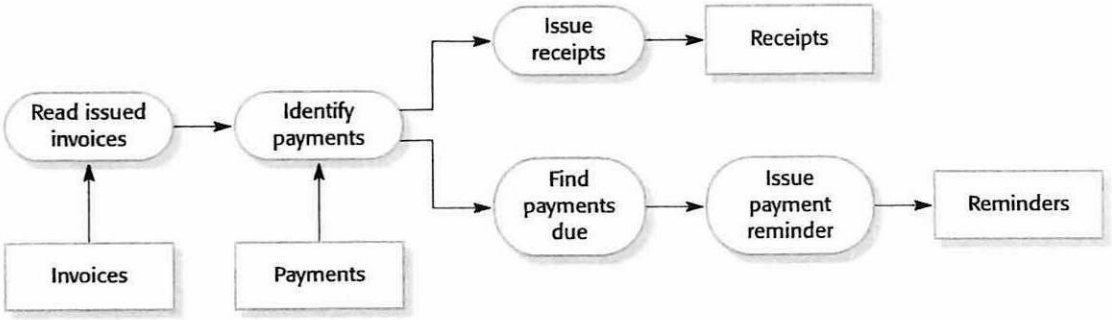

Figure Q1(d)

(i) The name of this architectural pattern;

(1 mark)

(ii) When it can be used;

(2 marks)

(iii) What is the advantage and disadvantage of this architectural pattern?

(3 marks)

Q2 (a) Explain two (2) open-source development license models.

(6 marks)

(b) Describe and compare the differences between the configurable application system and application system integration.

(4 marks)

(c) **Figure Q2(c)** shows the model of a data collector component for a sensor. Redraw the model by adding an adaptor linking a data collector and a sensor, where the sensor provides interface to start, stop and getdata functions.

(6 marks)

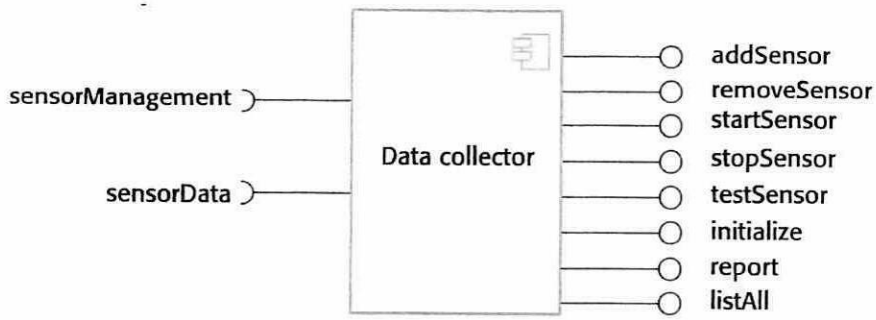

Figure Q2(c)

(d) As a software engineer, you have been given a task to develop a distributed system based on the two-tier client-server architecture, where the presentation layer is implemented on the client. Analyse this task, explain the possible architectural models and determine the best architectural model for this task.

(9 marks)

Q3 (a) Explain two (2) goals in software testing process.

(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) Describe three (3) types of software maintenance.

(6 marks)

(d) As a software manager, you have been given a task whether to upgrade or replace or scrap or continue maintaining a legacy system in your company. However, legacy system replacement is risky and expensive. Analyse this task and explain your strategy by providing the legacy system categories assessment.

(9 marks)

Q4 (a) Write the formula to estimate software cost based on reuse model.

(4 marks)

(b) The tasks of a manager are essentially people-oriented. Poor people management is an important contributor to project failure. As a project manager, explain and examine the crucial factors of people management.

(6 marks)

(c) Draw the diagram of risk management process in software engineering project management.

(9 marks)

(d) Consider a task you are not familiar with, such as developing a software for flying car. Explain how would you manage to solve this problem?

(6 marks)

-END OF QUESTIONS -