Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2022/2023

COURSE NAME	:	VEHICLE PRODUCTION SYSTEMS
COURSE CODE	:	BNG 31203
PROGRAMME CODE	:	BNG
EXAMINATION DATE	:	JULY / AUGUST 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 **FOUR (4)** PAGES

Q1 (a) The development planning department is the first step for creating an actual vehicle based on the planning or the styling. Briefly describe the role of the department in contributing to the creation of an actual vehicle.

(3 marks)

(b) Competitive car analysis is an essential tool for car makers to stay competitive in the market by developing better products and marketing strategies to meet the needs of the customers. Explain how competitive car analysis aid in the planning of the vehicle's development concept or target performance.

(4 marks)

(c) The development and design department are responsible for creating the initial concept and specifications for parts or systems, including their performance and cost considerations. They also conduct reviews and create drawings to establish the structure and shape of the components. Once the initial design is complete, they then proceed to refine and finalize the production drawings to ensure consistency and accuracy.

(i) List down **FOUR (4)** related designing sub-section which are accountable under the development and design department.

(4 marks)

(ii) Identify the key considerations that go into designing the body, door, and exterior parts of a vehicle, and how are these factors evaluated through CAD/CAE.

(4 marks)

(iii) Justify the key challenges involved in designing electric vehicles, and how designers address these challenges.

(4 marks)

(d) Productivity is a measure of how well resources are utilized to produce output. It relates output to input in any system, where some value addition is performed on the input resource. In factories and corporations, productivity is a measure of the ability to create goods and services from a given amount of labour, capital, materials, land, resources, knowledge, time, or any combination of those. Outline **THREE (3)** main factors that can impact productivity within an organization and give an example related.

(6 marks)

Q2 (a) The vehicle production process involves several stages, each of which is essential to produce a high-quality vehicle. Identify all the main stages involved in the vehicle production process and briefly explain the process involved in each stage.

(10 marks)

(b) Lean production is a manufacturing approach that originated in Japan and has since spread around the world. It is also known as the Toyota Production System (TPS), as it was first developed by Toyota in the 1950s. The goal of lean production is to eliminate waste and improve efficiency in manufacturing processes, ultimately resulting in higher-quality products and increased customer satisfaction. However, implementing lean production can be a complex process, and it is easy to make mistakes along the way. Examine **THREE (3)** common mistakes organizations make when implementing lean.

(6 marks)

(c) In lean production, there are seven types of waste, also known as Muda, that are important to identify and eliminate to improve efficiency and reduce costs.

(i) List down all the **SEVEN (7)** wastes in lean production.

(3 marks)

(ii) Explain how inventory waste impact lean production.

(3 marks)

(iii) Recommend strategies that can be implemented to minimize inventory waste in lean production.

(3 marks)

Q3 (a) Lean production techniques and their characteristics are very important processes to improve the vehicle production system. Based on this statement, identify the following Lean production techniques.

(i) Lean Audits.
(ii) 5S.
(iii) Poka Yoke.
(iv) Jidoka.
(v) Kanban system.

(10 marks)

(b) Lean drives out non-value-added activities while identifying customer value by optimizing the entire process from the customer's perspective. Justify **FOUR (4)** attributes in building a lean organization.

(8 marks)

(c) Sanden Air Conditioning (Malaysia) Sdn. Bhd. manufactures a heat exchange components for automotive air-conditioning systems. The owner of the company is trying to introduce the concept of lean manufacturing on one of its assembly lines. His intention is to implement the just in time system through Kanban using containers to reduce the inventory level. The details of the production data for heat exchange component in the assembly line are inclusive of setup cost RM10, holding cost RM100 per unit per year, daily production 200 units per day, annual demand 25,000 units (with usage of 100 units/day), manufacturing lead time 3 days, and safety stock ½ days of production.

(i) Computes the size of the Kanban container.

(3 marks)

(ii) Analyze the number of Kanban needed.

(4 marks)

Q4 (a) Quality is the ability of a product or service that is made precisely to specifications to meet customer needs conforming to manufacturing standardization.

(i) List out **THREE (3)** automotive manufacturing standards that applied in managing the quality to provide a competitive advantage at the organization.

(3 marks)

(ii) Explain how the quality international standard can lead to achieve sustained success.

(3 marks)

(iii) In addition to being a critical element in manufacturing, interpret the implications of quality for the organization.

(6 marks)

(b) Total Quality Management (TQM) refers to a quality emphasis that encompasses the entire organization so that it excels in all aspects of products and services that are important to the customer.

(i) Explain what is TQM tools and summarize the **SEVEN (7)** tools that are necessary for an effective TQM program.

(9 marks)

(ii) Pareto charts is one of the powerful tools in TQM program. Justify the purpose of using a Pareto chart in problem solving.

(4 marks)

- **END OF QUESTION** -