Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER I
SESSION 2019/2020

COURSE NAME	:	AUTOMOTIVE MANUFACTURING II
COURSE CODE	:	BNG 40103
PROGRAMME CODE	:	BNG
EXAMINATION DATE	:	DECEMBER 2019 / JANUARY 2020
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **FIVE (5)** PAGES

Q1 (a) Lean philosophy is derived from Japanese industries and aims to enhance productivity and manage the work environment.

(i) Describe the definition of lean production

(2 marks)

(ii) List down the **FIVE (5)** principles of Lean Management

(5 marks)

(b) Briefly explain **FOUR (4)** advantages of lean production system and explain your answers based on the performance of a company/premise.

(8 marks)

(c) Overproduction is the worst kind of waste because it causes other wastes and obscures the need for improvement. Overproduction waste results from producing more (or faster) than required.

List **FIVE (5)** possible causes for this type of waste in a manufacturing company.

(5 marks)

Q2 (a) As a student representatives from your institution, choose **ONE (1)** of the issue as listed below and construct a suitable Ishikawa diagram with **FOUR (4)** causes of the problem. Interpret each of the points that you mentioned in the Ishikawa diagram.

- Internet and Wi-Fi issues.
- Facilities & Classroom issues.
- Cafeteria issues.
- Student transportation facilities issues.
- Social issues of students.
- Library service facilities and reference materials issues.
- Facility maintenance issues.
- Campus administration and management issues.
- Collaboration with local communities and industries issues.

(10 marks)

(b) 5S is a workplace organization technique. It is a common starting point for Lean activities in a company. It helps create and maintain the efficiency and effectiveness of a work area.

Explain **THREE (3)** benefits of 5S techniques in a manufacturing company.

(3 marks)

(c) Stamping is one of the process in automotive manufacturing required the precision and accurate parameter setting. It is the process of placing flat sheet metal in either blank or coil form into a stamping press where a tool and die surface forms the metal into a net shape. This process also required long time to changes from one batch to another batch.

Based on the Single Minute Exchange of Dies (SMED) technique, list down **SEVEN (7)** steps involved in SMED.

(7 marks)

Q3 (a) Pak Jaya Sdn. Bhd is a manufacturing company that produces lawn seed spreaders. It wishes to set up a dedicated assembly line to produce 2,400 products a week. Process technologist have identified the required assembly tasks and times. This information is given in **Table Q3**.

(i) Based on the information given in **Table Q3**, distinguish the assembly line to produce the required output.

(13 marks)

(ii) Calculate the efficiency of the assembly line.

(2 marks)

(iii) Draw a Yamazumi board.

(5 marks)

Q4 (a) Explain **TWO (2)** benefits of Heijunka Technique.

(2 marks)

(b) Discuss **FIVE (5)** comparison between Kanban & E-Kanban system.

(10 marks)

(c) Shows **FOUR (4)** Poka yoke techniques that can be implemented in assembly line. Explain each of your answers with **ONE (1)** appropriate examples.

(8 marks)

Q5 (a) The objective of warehouse layout is to find the optimum trade-off between handling cost and costs associated with warehouse space. Consequently, management's task is to maximize the utilization of the total "cube" of the warehouse. That is, utilize its full volume while maintaining low material handling costs. We define material handling costs as all the costs related to the transaction. This consists of incoming transport, storage, and outgoing transport of the materials to be warehoused. These costs include equipment, people, material, supervision, insurance, and depreciation. Effective warehouse layouts do, of course, also minimize the damage and spoilage of material within the warehouse.

Briefly discuss modern warehouse management and terms such as *Automated Storage & Retrieval System (ASRS)*, *Cross-docking*, and *Random Stocking*.

(12 marks)

(b) A work cell reorganizes people, equipment and machines that would ordinarily be dispersed in various departments into a group so that they can focus on making a single product or a group of related products.

Based on **Figure Q5**, identify **FOUR (4)** advantages of work cell over assembly line.

(8 marks)

-END OF QUESTIONS –

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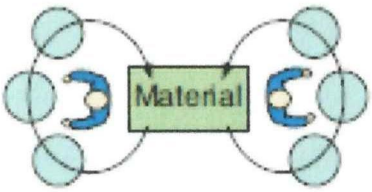
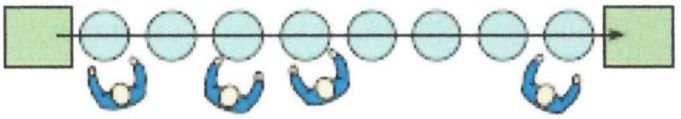
Table Q3

Work Element	Description	Time (Sec)	Immediate Predecessor (s)
A	Bolt leg to hopper	40	NONE
B	Insert impeller shaft	30	A, C
C	Attach axle	50	A
D	Attach agitator	40	B
E	Attach drive wheel	6	B
F	Attach free wheel	25	C
G	Mount lower post	15	C
H	Attach controls	20	D, E
1	Mount nameplate	18	F, G

Note: Assume a 5-day week and 8 productive hours per day



(a) Work Cell



(b) Assembly Line

Figure Q5