Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
(TAKE HOME)
SEMESTER I
SESSION 2020/2021

COURSE NAME	:	VEHICLE BODY TECHNOLOGY
COURSE CODE	:	BNG 40203
PROGRAMME CODE	:	BNG
EXAMINATION DATE	:	JANUARY / FEBRUARY 2021
DURATION	:	2 HOURS 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

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

Q1 (a) Automotive stampings are evaluated based on six formability indices. Based on this statement, analyze **FOUR (4)** of formability indices that used as a references in automotive stamping process.

(8 marks)

(b) Illustrates the diagram that shows the sequences in the stamping line. Identify the process that involve in each sequences.

(10 marks)

(c) Today, many cars consist significant amounts of aluminum, as designers have become increasingly aware of the metal's demonstrated advantages. More than 20% of the cars produces in Europe have an aluminum hood and several high-performance sport car bodies, such as Ferrari and Lotus, are also produces in aluminum. Justify **FOUR (4)** significances of aluminum in automotive body construction.

(4 marks)

(d) Explain the definition of hydro-forming process.

(3 marks)

Q2 (a) Categorize automotive body area that apply welding technology below.

(i) TIG welding
(ii) Brazing
(iii) Spot welding

(6 marks)

(b) Describe the basic guidelines to follow when MIG welding aluminum.

(12 marks)

(c) Refer **Figure Q2 (c)**, construct **ONE (1)** method with illustration for evaluate the performance of the welding.

(4 marks)

(d) Based on **Figure Q2(d)**, analyze the causes happen on the bead shapes in the cutaway diagram for MIG operation.

(3 marks)

Q3 (a) Explain the possible cause of automotive paint defects below.

(i) Fish eye
(ii) Cratering
(iii) Orange peel

(6 marks)

(b) Justify the possible cause of corrosion types below.

(i) Perforation-based corrosion
(ii) Galvanic corrosion
(iii) Pitting corrosion

(9 marks)

(c) The robotic painters introduce a repeatable, reliable to deliver the spray paint on the BiW at high production rates. The painting robotics, as in the case of the welding robots, should be programmed to design their end - effecter trajectories so they apply the adequate number of paint layers (over - lap) according to the desired film thickness and shell CAD geometry. Interpret **TWO (2)** styles painting robotics can be programming.

(6 marks)

(d) Justify the significance of spectrophotometer in automotive painting process.

(4 marks)

Q4 (a) Aspect of ergonomics of the final assembly area is mostly concern matter in production line.

(i) Describe the basic ergonomic work principles that should be considered in final assembly.

(ii) Discuss the significance of the ergonomics concern in the assembly area

(10 marks)

(b) Interpret each of the fastening strategies used in automotive mechanical fastening.

(9 marks)

(c) Explain the important of washer installation in a mechanical joint on the final clamp force.

(3 marks)

(d) Describe the operations done within the chassis installation area.

(3 marks)

-END OF QUESTIONS –

FINAL EXAMINATION

SEMESTER / SESSION : SEM I / 2020/2021
COURSE NAME : VEHICLE BODY TECHNOLOGY
PROGRAMME CODE : BNG
COURSE CODE : BNG 40203

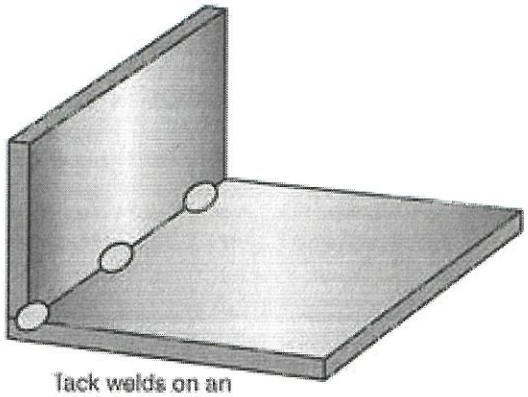

Figure Q2 (c)

(i) **(ii)**

Figure Q2(d)