



UNIVERSITI KUALA LUMPUR
KAMPUS CAWANGAN MALAYSIAN SPANISH INSTITUTE

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : SIB23012 (V2)
COURSE NAME : AUTOMOTIVE SAFETY
PROGRAMME NAME : BACHELOR OF BUSINESS TECHNOLOGY
(HONOURS) IN AUTOMOTIVE MANAGEMENT
DATE : 23 JANUARY 2026
TIME : 3:00PM – 5:00PM
DURATION : 2 HOURS

INSTRUCTIONS TO CANDIDATES

1. Please read the instructions given in the question paper **CAREFULLY**.
2. This question paper is printed on both sides of the paper.
3. This question paper consists of **ONE** section.
4. Section A consist of five questions. Answer **FOUR (4)** questions only.
5. Please write your answer on the answer booklet provided.
6. Please answer all questions in English only.
7. Refer to the attached Formula/ Appendies. *Tick if applicable*

THERE ARE 7 PAGES OF QUESTIONS, INCLUDING THIS PAGE.

SECTION A (Total: 100 marks)

Answer FOUR (4) questions.

Please use the answer booklet provided.

Question 1

By customizing the workplace to suit the individual requirements of the worker, ergonomics aims to enhance work quality, productivity, and worker well-being, contrasting with traditional approaches that expect workers to adapt to their work environments.

You are required to analyze Figure 1 using ergonomic philosophy based on anthropometric analysis. The impact of analysis must be meeting ergonomic expectation which are comfort, safety, and quality.

Refer Below - Figure 1 : The body posture of the driver. .

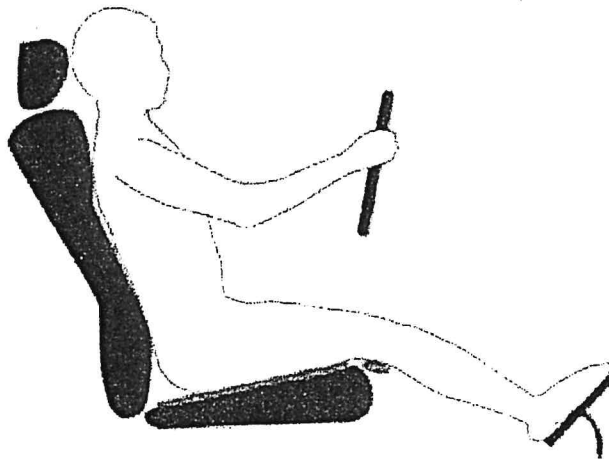


Figure 1: The body posture of the driver.

- (a) Identify FIVE (5) dimensions related to ergonomics based on the situation of Figure 1.

(5 marks)

- (b) Evaluate the identified dimensions from question (a) by using an anthropometric analysis.
- (10 marks)
- (c) Injury tolerance limits, such as fractures, organ injuries, and other traumas have been classified as Abbreviated Injury Scale (AIS) and the Overall Abbreviated Injury Scale (OAIS). Identify FOUR (4) purposes of Injury Tolerance Limits:
- (8 marks)
- (d) Explain the injury mechanisms for external injuries to the human body, and mechanisms for internal injuries?
- (2 marks)

Question 2

A traffic collision is also called a motor vehicle collision, car accident, or car crash occurs when a vehicle collides with another vehicle, pedestrian, animal, road debris, or other stationary obstruction, such as a tree, pole, or building. Traffic collisions often result in injury, disability, death, and property damage as well as financial costs to both society and the individuals involved.

- (a) Identify potential root causes based on the FIVE (5) categories of the traffic collision.
- (10 marks)
- (z) Discuss FIVE (5) potential root causes of the traffic collision based on the human factor.
- (10 marks)
- (c) State FIVE (5) main factors influencing the driver's field of view.
- (5 marks)

Question 3

A crash test is a form of destructive testing usually performed to ensure safe design standards in crashworthiness and crash compatibility for automobiles or related components. To test the car safety performance under various conditions and during varied types of crashes, vehicle manufactures crash test their cars from different angels, different sides and with different objects, including other vehicles.

If the results of the frontal simulation crash test show the change in acceleration (a) started from 80g, 100g, 140g, 160g. If t_1 and t_2 consider the same for all levels of acceleration (a) which are at 5ms^{-1} and 12ms^{-1} .

- (a) Identify THREE (3) ranges of the Head Injury Criteria (HIC). (6 marks)
- (b) Analyze the results of Head Injury Criteria (HIC) for each accelertaion (a). (10 marks)
- (c) Discuss the obtained results from question (b). (4 marks)
- (d) State the occupant criteria for the frontal simulation crash test. (5 marks)

Question 4

"The motor vehicle has a duty to transport humans and goods from place A to place B, as a safely, as quickly and as comfortable as possible also as efficiently and environmentally friendly as possible".

- (a) Define the automotive safety from the perspective of Malaysian Road and Act Regulation.

(2 marks)

- (b) In this context, draw a diagram to show the four components of automotive safety.

(10 marks)

- (c) The term 'safer cars' with relation to the new car assessment program (NCAP) is to distinguish one vehicle from another in terms of safety performances, namely on active safety aspects.

(8 marks)

- (d) As Sales Executive for Automotive Company, provide five reasons of important to displayed NCAP labelling on all passenger cars .

(5 marks)

Question 5

The markings on a tire are the words, letters and symbols written on the sidewall of the tire. As well as the name of the brand and the range, we can read the size and characteristics of the tire: width, sidewall height, diameter, tread pattern, load index and speed rating as shows in figure below.

Refer Below - Figure2 : The tire marking .

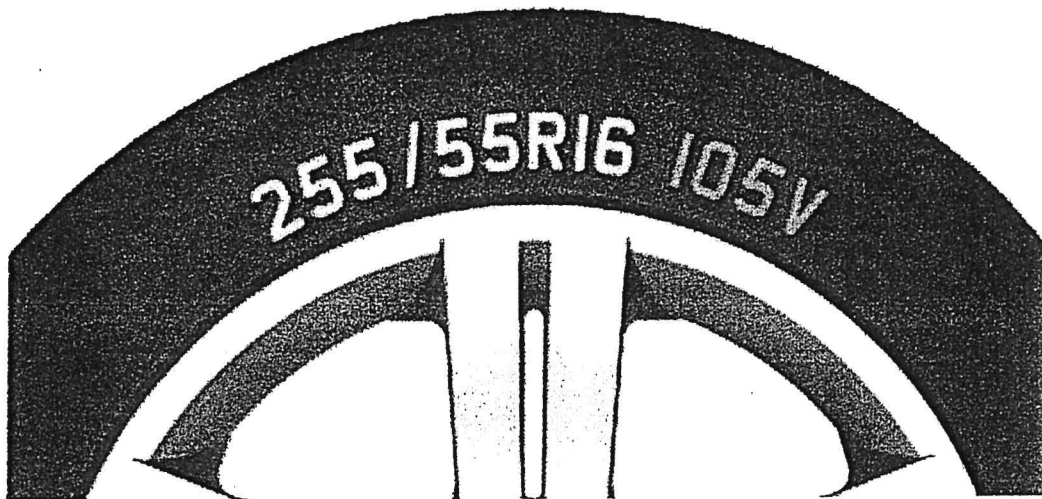


Figure 2: The tire marking

- (a) Explain the meaning of the tyre specification "255/55R16" by breaking down each component, including tyre width, aspect ratio, tyre construction, and wheel diameter. (8 marks)
- (b) Tire is one of the components in the activation of the Antilock Brake System (ABS). Discuss and illustrate the process activation of the ABS. (15 marks)
- (c) Discuss TWO (2) regular maintenances of the tire in order to achieve the objective of automotive safety. (2 marks)

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END OF EXAMINATION PAPER

