



UNIVERSITI KUALA LUMPUR
KAMPUS CAWANGAN MALAYSIAN SPANISH INSTITUTE

FINAL EXAMINATION
OCTOBER 2025 SEMESTER

COURSE CODE : SIB24012 (V2)
COURSE TITLE : AUTOMOTIVE ENGINEERING FUNDAMENTALS
PROGRAMME NAME : BACHELOR OF ENGINEERING TECHNOLOGY (HONS) IN
MECHANICAL DESIGN
DATE : 25 JANUARY 2026
TIME : 9:00AM - 11:00AM
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 consist of TWO sections.
4. Answer ALL questions for Section A.
5. Section B consist of four questions. Answer THREE (3) questions only.
6. Please write your answer on the answer booklet provided.
7. Please answer all questions in English only.
8. Please answer MCQ/EMQ questions using OMR sheet. *Tick if applicable*
9. Refer to the attached Formula/ Appendies. *Tick if applicable*

THERE ARE 7 PAGES OF QUESTIONS INCLUDING THIS PAGE

SECTION A (Total: 40 marks)

Answer ALL questions.

Please use the answer booklet provided.

Question 1

The automobile is a self-propelled vehicle that travels on land. There are many types of vehicles available on the market. People can choose which type of vehicle suits their requirements.

- (a) In your own words, define engines. (2 marks)
- (b) Through inspection of the engine mounts, briefly explain how to identify whether the engine is rear wheel drive (RWD) or front wheel drive (FWD). (4 marks)
- (c) There are many basic parts and systems that make up the whole automobile system. List and explain the functions of the seven of them. (14 marks)

Question 2

In automobiles, the power from the engine to the drive wheels is carried by the powertrain. It's flown through a clutch in the vehicle with manual transmission or manual transaxle. The clutch is usually operated by the driver's foot. Some clutches have a power-assist device to reduce driver effort.

(a) Define clutch

(2 marks)

(b) Describe the effects of engaging and disengaging the clutch.

(8 marks)

(c) In an automatic powertrain, the torque converter components are the impeller turbine, stator, fluid, and housing. Explain the function of those five components.

(10 marks)

SECTION B (Total: 60 marks)

Answer THREE (3) questions only.

Please use the answer booklet provided.

Question 1

An engine is a component of an automotive system that provides power by converting thermal energy from the fuel to produce force and motion.

- (a) The sub-system supports the I.C. engine for continuous running consist of fuel system, ignition system, lubricating system, cooling system, exhaust system, and electrical and electronic system. Choose four of the six sub-systems and examine their function and other related components that make each one work.

(12 marks)

- (b) With a simple sketching, show how the four stroke spark-ignition engine works.

(8 marks)

Question 2

The suspension system components are located between the frame of the vehicle and the road.

- (a) Describe two purpose of suspension system.
(2 marks)

- (b) Distinguish the four types of springs used in automotive suspension systems (coil spring, leaf spring, torsion bar, and air spring)
(12 marks)

- (c) If only soft springs were used to improve riding comfort, the car body would lean out excessively during turns, due to centrifugal force. In cars with independent suspensions, this tendency is especially great. Indicate the role of stabilizer bar to improve this situation - to reduce by roll and increases tire traction as well.
(6 marks)

Question 3

Due to its ability to generate power by turning fuel's thermal energy into force and motion, the engine is a crucial part of any automobile system. This image of an engine components is found in the figure below.

Refer Below - Figure1 : Engine components .

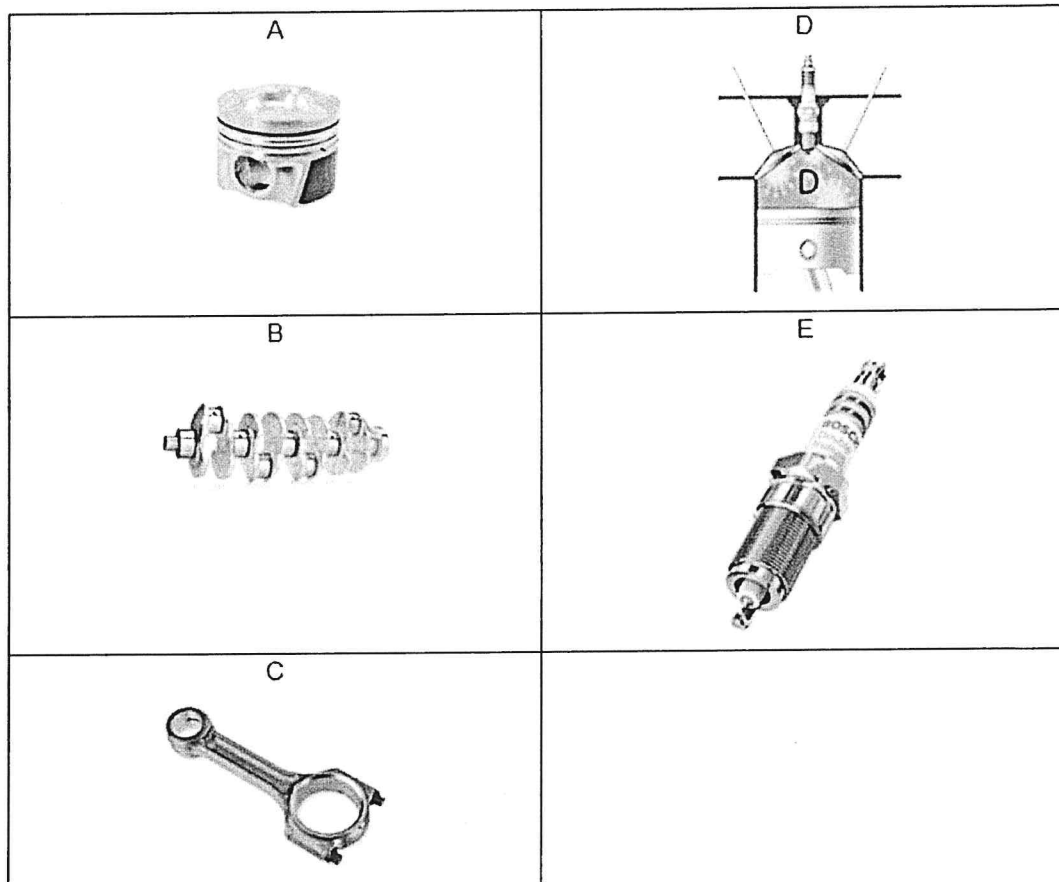


Figure 1: Engine components

- (a) As indicated in the figure above, identify and demonstrate the purpose of each of the components of A, B, C, D, and E.

(15 marks)

- (b) Discuss the piston's oil ring and compression ring functions.

(5 marks)

Question 4

There are two main types of braking system; disc and drum braking system. The brakes power always assisted by the fluid (air or oil).

- (a) Explain the function of brakes and list the 3 brakes characteristics are required for good braking performance.

(4 marks)

- (b) The brake fluid consist of several type such asDOT3, DOT4 and DOT5. Describe the characteristics, roles in braking system and the different among of each type.

(16 marks)

END OF EXAMINATION PAPER

