MURANG'A UNIVERSITY OF TECHNOLOGY

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF MECHANICAL ENGINEERING

UNIVERSITY ORDINARY EXAMINATION

2024/2025 ACADEMIC YEAR

FOURTH YEAR **FIRST** SEMESTER EXAMINATION FOR BACHELOR OF TECHNOLOGY IN MECHANICAL ENGINEERING

EMT 402 – AUTOMOTIVE TECHNOLOGY

DURATION: 2 HOURS

INSTRUCTIONS TO CANDIDATES:

1. Answer question ONE and any other two questions.
2. Mobile phones are not allowed in the examination room.
3. You are not allowed to write on this examination question paper.

SECTION A – ANSWER ALL QUESTIONS IN THIS SECTION

QUESTION ONE (30 MARKS)

(a) What is an an automobile? (2 marks)

(b) What is a frame? State the three types of frames. (4 marks)

(c) Explain the three types of chassis. (6 marks)

(d) Explain the difference between the front engine rear wheel drive and the front engine front wheel drive. (3 marks)

(e) Explain the basic operation of the Electronic Controlled Gasoline Injection System (ECGIS). (6 marks)

(f) With the help of a diagram explain the operation of a single clutch plate. (5 marks)

(g) Explain the principle of a suspension system. (4 marks)

SECTION B – ANSWER ANY TWO QUESTIONS IN THIS SECTION

QUESTION TWO (20 MARKS)

(a) Differentiate between the Single-point Injector System and the Multipoint Fuel Injection system. (4 marks)

(b) Explain the working principle of the Electronic Ignition System. (6 marks)

(c) Describe the operation of the Anti-Lock Braking System (ABS). (6 marks)

(d) Describe the principle of gearing. (4 marks)

QUESTION THREE (20 MARKS)

(a) With the help of a diagram explain the operation of a waste gate turbo charger. (5 marks)

(b) Describe the different automatic transmission modes. (6 marks)

(c) Differentiate between the two types of drive shafts. (6 marks)

(d) Give three advantages of Air Brakes. (3 marks)

QUESTION FOUR (20 MARKS)

(a) What is a catalytic convertor? A three-way catalytic convertor has three simultaneous functions. Explain. (4 marks)

(b) With the help of a diagram explain the operation of a differential gear assembly.(8 marks)

(c) Describe the construction of the Hydraulic Braking System. (8 marks)