



ELIZADE UNIVERSITY, ILARA-MOKIN,
ONDO STATE, NIGERIA
DEPARTMENT OF AUTOMOTIVE ENGINEERING

SECOND SEMESTER EXAMINATIONS

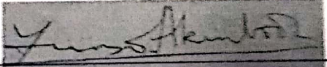
2017/2018 ACADEMIC SESSION

COURSE: ATE 306 – Automotive Mechatronics I (3 Units)

CLASS: 300 Level Automotive Engineering

TIME ALLOWED: 3 Hours

INSTRUCTIONS: Answer any other FOUR (4) questions


HOD'S SIGNATURE

Date: July/August, 2018

Question 1 (15 MARKS)

- What is "Automotive Mechatronics"?
- What is the distortion energy failure theory?
- What is a mechatronic system? Show an example by a schematic layout.

Question 2 (15 MARKS)

- State four important measurement variables (measurands) for an automotive control system?
- What are automotive sensors? State 4 examples and applications.
- Describe the operation of any automotive function sensor.

Question 3 (15 MARKS)

- What are automotive actuators? How are they classified?
- State the types of switching and control actuator functions in the transmission system and describe one.
- What is the main function of a microcontroller in an automotive system? State the features of the microcontroller.

Question 4 (15 MARKS)

- What are the features of an automotive electrical distribution system? What are the objectives of this system?
- Differentiate between a normally-open (NO) and a normally closed (NC) switch/relay.
- Give 3 examples of electronic components that are used as switching devices in the automobile.
- What is a solenoid and state its function.

Question 5 (15 MARKS)

- What is a wiring diagram? Draw a schematic of a typical automotive wiring.
- Differentiate between "primary" and "secondary" wiring in an automobile.

- (c) What do you understand by "color codes & circuit numbering"? Decode the following illustration: **J 2A 18 BL/Y**
- (d) What is automotive *multiplexing*? Give 2 applications and state 2 advantages.

Question 6 (15 MARKS)

- (a) Describe the functions of the two electrical circuits that operate an automotive starter system.
- (b) What is the principle and function of the automotive 'charging system'?
- (c) What do you understand by the term 'sensing voltage'? Give an application.
- (d) What is an electronic engine control system? Provide a schematic of this system showing all the components.